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Gas Journal

LIGHT - HEAT - POWER - BY-PRODUCTS

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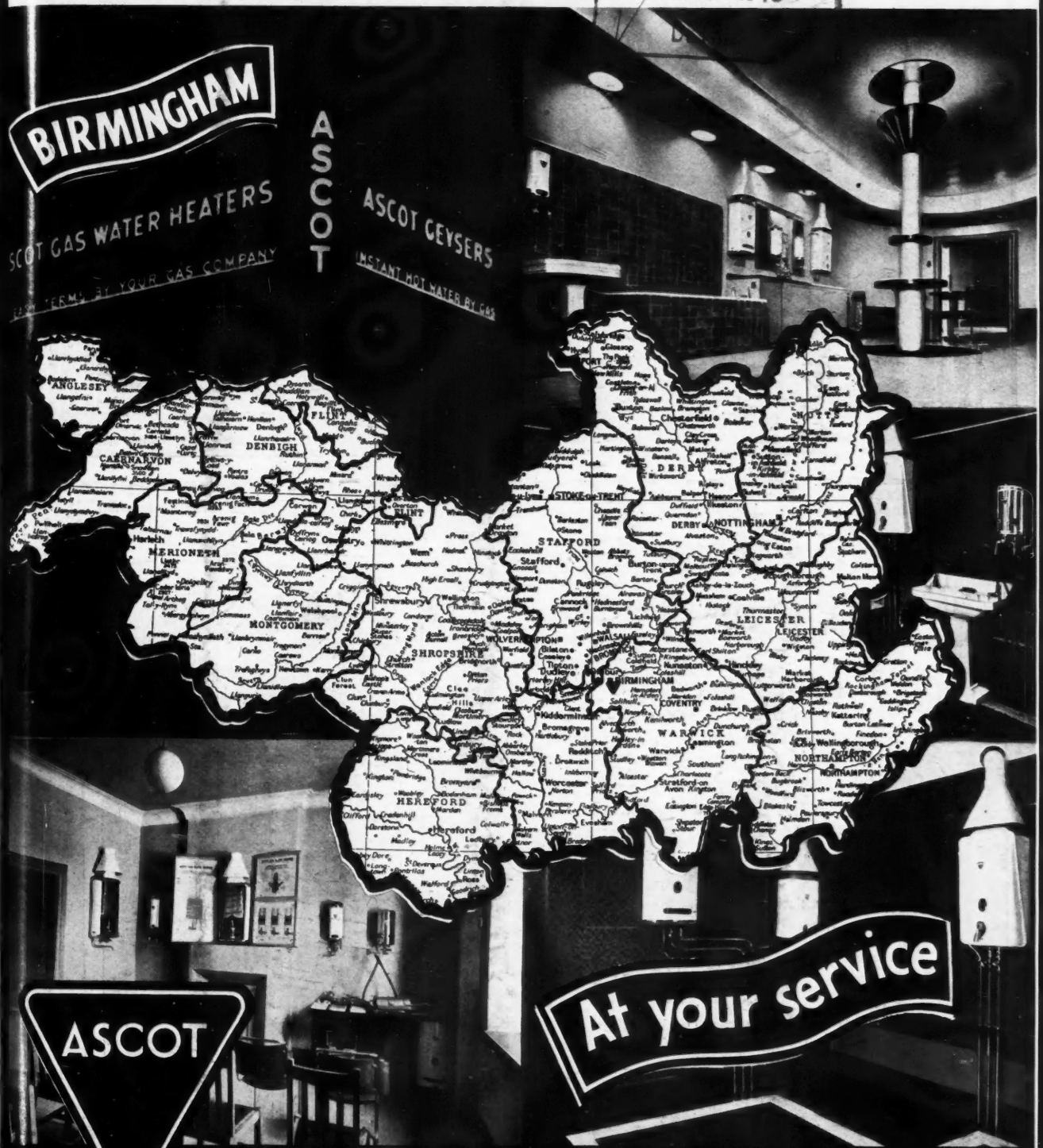

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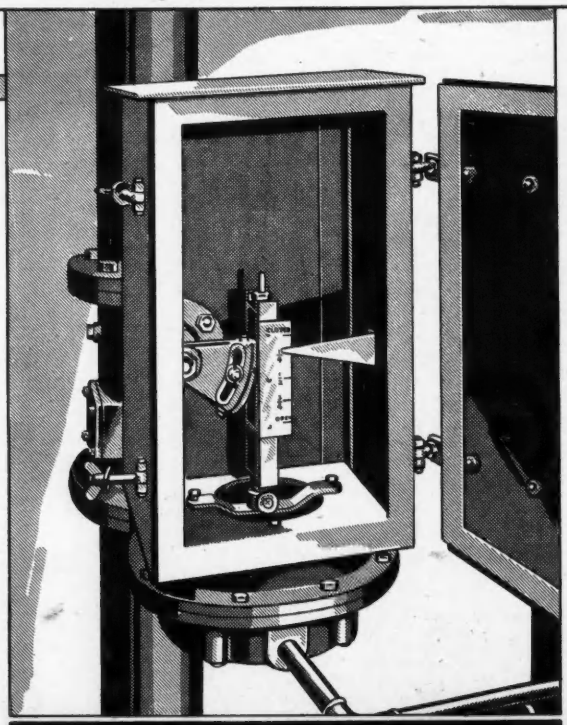

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GAS JOURNAL, MAY 9, 1945

VOL. 245 97th YEAR No. 4277

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STILL MORE PLANS!!!

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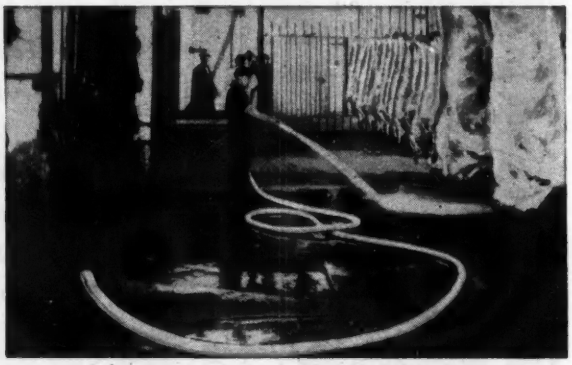

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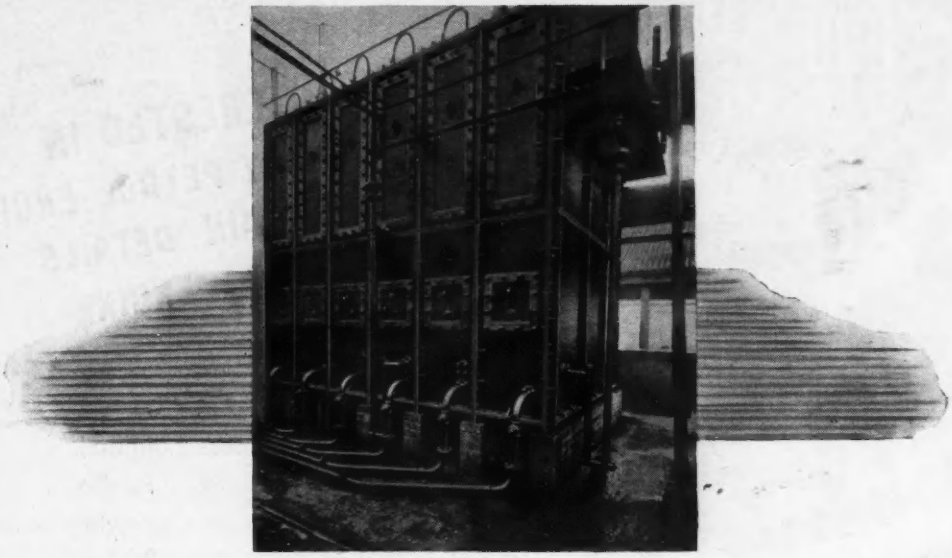

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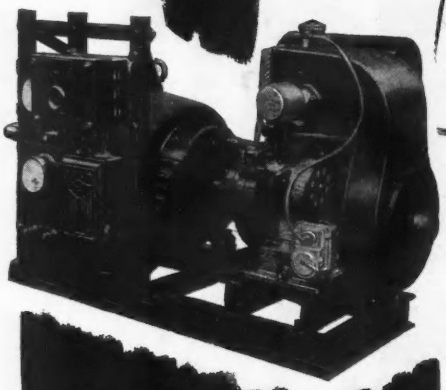

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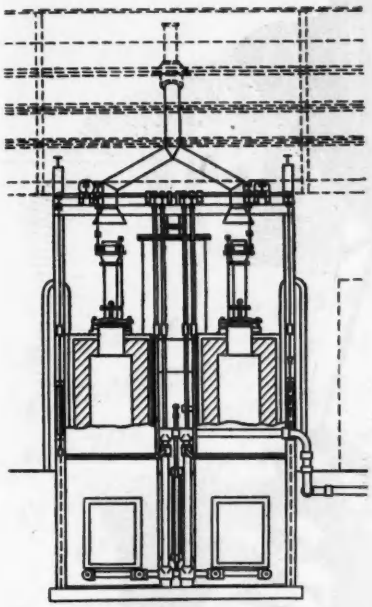

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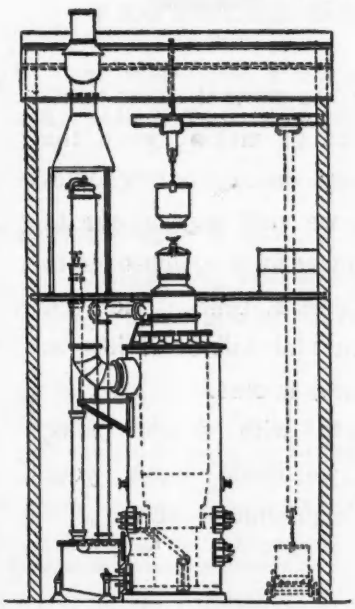

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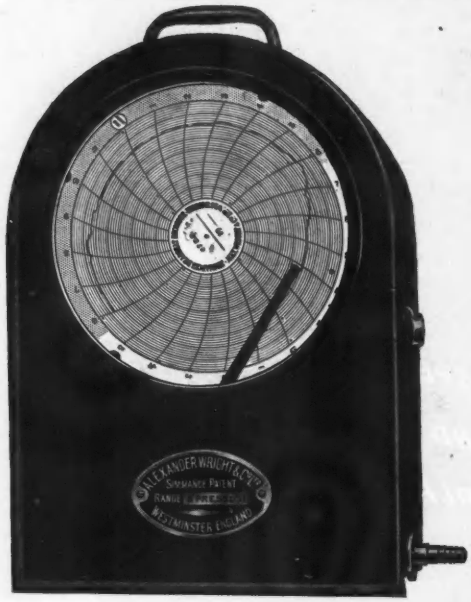

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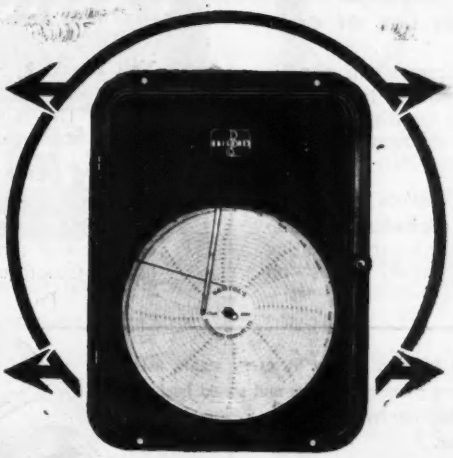

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UTILISATION OF STEAM (*Bulletin No.* 22)

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Established 1892

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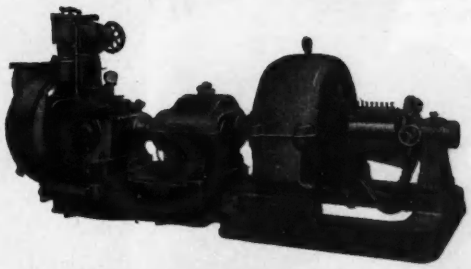

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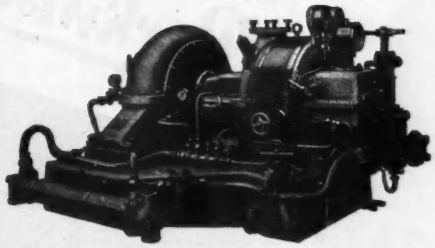

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GAS JOURNAL, MAY 9, 1945

VOL. 245 97th YEAR No. 4277

May 8, 1945

By the grace of God and the fortitude, endurance, and skill which He gave to her leaders and her people, both combatant and civilian, our nation on this historic date was free of the chains and slavery into which her enemies had so confidently expected to cast her nearly five years before. How great their confidence; how grave our peril in those dark days of 1940. *To-day, how utter the reversal of the situation, except that chains and slavery are not our way with the vanquished foe, however abject his surrender, whatever crimes he has committed against humanity. And now, having recorded our thankfulness that a mighty effort has brought us a military victory mightier than any that ever went before, what words have been left to us to say by those whom we are all proud to recognize as our leaders, or to write by those who have already acclaimed our national greatness and that of our allies in columns which reach the public more swiftly than the weekly Press? Of one thing we are certain—that this is a time for thanksgiving and rejoicing on the national rather than on any sectional plane, and that the Industry which we represent in particular would not, at this juncture, desire any eulogy of that share of the nation's burden which it has carried through the war years. Rather would it re-dedicate itself, as an integral part of the whole, to the gigantic tasks ahead; to the winning of that part of the world war which remains as yet unwon; to the rehabilitation of our own fair land; to the settlement of the world in saner shape than it has ever enjoyed under previous brands of so-called civilization.*

ON WITH THE WORK

THE meeting of the Southern Association of Gas Engineers and Managers held under the Presidency of Mr. R. C. Taylor in London last Thursday was notable for more reasons than one. The war news which had flowed through in the preceding few days and even hours had naturally given rise to an atmosphere of buoyancy and expectation of victory declaration, and Southern gas engineers met in lighter heart. There was, too, particular import in the meeting in that it was addressed by Mr. A. E. Sylvester, the newly created Governor of the Gas Light and Coke Company, and spokesman of the Gas Industry in his capacity of Chairman of the British Gas Council. It marked the first occasion of an Address by Mr. Sylvester to a representative gathering of gas engineers. And at an informal luncheon preceding the meeting those present had the benefit of hearing Sir Hubert Houldsworth, K.C., Controller-General at the Ministry of Fuel and Power.

Our full report of what Mr. Sylvester had to say will be found on later pages of this issue of the "JOURNAL," which also contains our account of the business proceedings, which had much domestic interest. Quiet in tone, concentrated on a particular but obviously vital aspect of the Gas Industry's activities—the economic and financial aspect, the relation of price to cost—this lucid and unambiguous Address, pointing the way to future development and future policy, will, we are sure, be studied very carefully by all within our Industry and by many outside it, for its implications are many and far-reaching. In modestly, perhaps too modestly, giving expression to views formulated by one trained in the school of accountancy and following years of direct application of this special knowledge to Gas Industry problems, Mr. Sylvester indulged in neither the dramatic nor the rhetorical; perhaps because of this his Address was all the more penetrative. The hum of informal discussion which followed among his hearers afterwards was as unusual a feature of a Southern "afternoon tea" and it provided unmistakable indication of the discussion it will meet in far wider circles.

It is factual that in helping the war effort from the very beginning the Gas Industry has done magnificent work. It is true also that it has indulged in a flood of talk by no means inconsiderable. As we write, a declaration of victory in the European theatre of war is imminent; and at the meeting last Thursday Mr. Sylvester asked whether the time had not arrived for the Industry to think in terms of action and, quite bluntly, not to talk so much. What impressed us most was that he did not content himself with rhetorical urges to the Gas Industry to seek "a policy," but indicated a well-defined policy within certain limits which, there is no doubt, his large audience unanimously agreed was fully worthy of investigation. In other words, he offered us something concrete and tangible with which to make a beginning, and we have no reason to believe that that will be the end of his resources. Contending that politics do not make town gas, and that the question of ownership is a political one, he suggested that the British Gas Council has, in fact, plenty of work to do if it limits itself to problems which affect our Industry as a supplier of heat service, with the emphasis on "Service." And what, he asked again, are we as an Industry doing to put the financial and economic aspects of this service on a more uniform, a more equitable, and a more readily understandable basis? How are we to maintain and develop our several loads, domestic and industrial? What is the nature of our front against likely competitive inroad? Think of the multitude of ways in which gas service is offered to the public to-day throughout the country, without semblance even of regional uniformity of tariffs and without any coherent interpretation of the cost of supplying particular loads. Are we sure of our bases, and do we know how to build up our business without ultimately putting our finances out of gear? And an intelligent public is quick to discern palpable discrepancies in the charges made for similar service by neighbouring undertakings and competing interests and equally prepared to transfer its custom.

Looking to the future, no gas undertaking should regard as an index to its progress the overall profit it makes, but every

undertaking should know the extent to which each individual item of the gas load is contributing to composite sales. From this premise Mr. Sylvester went on to delineate his conception of the basis of gas costing, of the charges for heat service given in relation to expansion of this service. His suggestions in this regard are given on a later page, and we need not enter into detail about them here, though we may usefully emphasize a few points. We would, for example, draw attention to his comments on "repairs and maintenance" and "renewals and depreciation" of gas-making plant; to his insistence that load factor as affecting both manufacturing and distribution costs should be studied so that comparisons may be properly drawn between one gas undertaking and another, that there should be agreement on principles of assessment; to the way in which he tackled the element of "administration and service" cost, with his emphasis that each class o fconsumer should contribute his fair share to the cost at which gas service can equitably be supplied to him; to his remarks on the relationship between overheads and consumption per consumer; to his suggestions in regard to two-part domestic tariffs and block rates.

Above all, we would stress the major purport of the Address, which we regard as a basic key to sound economic development amid what may well prove in the years ahead a maelstrom of competition in the domestic and industrial heat service fields, and not as a cautionary recommendation for the retention of existing gas load. Just as we are certain that the public will appreciate and respond to a clearer and more uniform conception of the charges made for different heat services on the part of the Gas Industry, so this clearer conception will show to what measure and in which ways the efforts of the Gas Industry and of individual gas undertakings should be put forward and directed. The immediate post-war years ahead are not destined to be by any means straight sailing. Let us therefore know more about the capacity of our ship so that it may go forward safely and swiftly amid whatever rocks may lie ahead.

If, then, we interpret Mr. Sylvester aright, factual knowledge of what each particular load can in equity afford to bear is a sure starting ground for flexibility of idea; it demands rather than precludes enterprise. Enterprise and the haphazard are not good business bedfellows. "Hoping for the best" is no sort of policy in the long run. It by no means follows that what one may lose on the swings one will recoup on the roundabouts. And why should consumers of particular classes of load be penalized? If, for example, a domestic consumer desires gas for space heating, why should he be offered gas for the purpose at prices which in effect are subsidized by charges made for some other type or types of gas business, domestic or industrial? Whence thoughts inevitably turn to the systems of charge adopted by the electricity industry. Do the charges made for the different domestic electrical loads bear any relation to the actual costs of supplying current for these particular loads? And is what seems to be temporary success within severely circumscribed limits any true index to the future satisfaction of the electricity consumer? We will not go into detail about this, but we may mention that in 1939 average revenue for electricity for all purposes represented a penny a unit. For domestic cooking and heating, tariff rates were available at a halfpenny a unit. At that time the electrical industry was meeting only 10% of the heating and cooking load carried by the Gas Industry, while domestic lighting represented some 25% of the domestic electrical load. It is by no means idle to ask to what extent the charges made for the electric lighting load were in fact subsidizing the charges made for domestic cooking and heating loads. It is of interest, too, to consider the rates charged for electricity for industrial power purposes. No doubt many gas undertakings were paying well over a penny a unit for current which provided the suppliers with an excellent load factor, the while these very gas undertakings were faced with electrical competition for domestic heat purposes at an inferior load factor at less than half the price. In relative terms the picture is the same to-day. Wherein lies consumer equity?

A SORRY PROSPECT

FOR a long time past grave warning has followed grave warning regarding dwindling coal output, and already we have been told by the Minister of Fuel and Power to prepare for still worse things to come in the winter of 1945–46, irrespective of war or peace, tyranny or liberation. And the speech of Sir Hubert Houldsworth, Controller-General at the Ministry, at the luncheon of the Southern Association last Thursday, albeit a speech gratifying to the Gas Industry, did little to relieve the gloomy coal outlook. Sir Hubert paid tribute to the work of our Industry in the war years, which work he described as magnificent. He well appreciated, he said, that the supplies of coal to gas undertakings had been wanting in both quantity and quality, that at the moment stocks at gas-works were at a disturbingly low level, and that every effort must be made to build up these stocks before the onslaught of next winter's cold. Yet facts stood out, and facts must be faced. In the past few years gas undertakings had been supplied with coals of types which normally they would not be prepared to take, but he saw nothing likely to ameliorate this condition during the forthcoming winter, and asked that the co-operation so readily exhibited and put into practice in the past should be further extended. Our Industry will, of course, extend this co-operation—indeed, if it is to fulfil its purpose as a national and a public service, it has no alternative—and it will duly, we suppose, gasify more coke, even at the expense of jeopardizing the goodwill of the millions of consumers of solid smokeless fuel resulting from carbonization. But it is all rather a sorry prospect. How long are we to shuffle along so impotently till the coal so vital to this country's existence is liberated in quantity and quality to be utilized efficiently in the nation's interest?

Personal

The British Hard Coke Association, representing the Coking Industry of the country, has appointed Dr. E. W. SMITH, C.B.E., F.R.I.C., M.I.Chem.E., as Consultant on all matters relating to the supply of coke-oven gas.

Letter to the Editor

Reflections on the Reid Report

DEAR SIR,—It is a curious exercise to turn again to the Reid Report on Coal Mining, and to compare its recommendations with what is required in the Gas Industry to remould it nearer to the heart's desire, particularly the conclusion under the heading "The Conditions of Success."

The Technical Advisory Committee came to the conclusion that "it is not enough simply to recommend technical changes which we believe to be fully practicable, when it is evident to us, as mining engineers, that they cannot be satisfactorily carried through by the industry organized as it is to-day." That conclusion would be adopted *in toto* by any honest body of gas engineers.

There is "a wide range of problems . . . in which combined action upon a broad basis presents the only satisfactory solution." There is a sentence which is practicable to the Gas Industry without altering a word. The Committee went on to say it was evident that it was not possible to provide for the soundest and most efficient development and working of an area unless the individual concerns are "merged together into one compact and unified command of manageable size, with full responsibility." The problem is not quite the same in the Gas Industry, but a similar principle is involved. It is evident to any candid student of affairs that unless the supply of gas to every sizeable conurbation is concentrated into "one compact and unified command" there is overlapping, divergence of policy irritating to the population, and generally a failure to obtain the maximum achievement. On the other hand, the Gas Industry is not one, either, which ought to be conducted "on any stereotyped plan." There is no reason, for instance, why sometimes integration should not take the form of an amalgamation of undertakings spread over a comparatively thinly populated area, somewhat on the lines of the holding company, always provided that such amalgamations should have a sound economic and, above all, geographical basis. And whatever degree of integration is decided upon, scope must be left within each unit for the fullest opportunity for, and encouragement

of individual initiative, subject to the overriding consideration that if a comprehensive scheme of reorganization is to be carried through, "an Authority must be established which would have the duty of ensuring that the industry is merged into" suitable units. And thus we come to the most far reaching of the recommendations of this Committee—that " the existence of such an Authority, endowed by Parliament with really effective powers for this purpose, is a cardinal necessity."

Chapter XX of the Report, "Training and Education," might also be paraphrased in terms of the Gas Industry. Not that we are entirely lacking in this direction, but the existence of "compact and unified" undertakings would provide a far better training ground on the purely practical side than we have at present. Under present conditions the personnel of the Gas Industry is far too much stratified into big-works men and little-works men, and there is very little chance of a young man, however good his technological qualifications, to move from one to the other. Under a "unified command" he could be moved and trained according to the requirements of the Industry as a whole.

Yours faithfully,

May 2, 1945. "GAS ENGINEER."

Institute of Fuel

To encourage the reading of Papers by Student Members of the Institute, also those taking courses at Universities and Technical Colleges, the Council have decided to make an annual award of a Medal, together with a prize consisting of books and instruments to the value of £5. The rules governing the award of this Prize and Medal are as follows:

The Council of the Institute of Fuel invite competition for a Medal, together with a prize of books or instruments to the value of £5 to be awarded annually for a Paper submitted by a student Member of the Institute, under 25 years of age, or by a student under 25 years of age of any University or Technical College in the United Kingdom.

The Paper shall deal with some subject relating to the preparation or utilization of fuel, or allied subjects. While the student is left free to choose his own subject if he so desires, the following subjects are suggested as a guide to his choice:

(*a*) Discuss the industrial use of any two of the following gases: Town Gas; Coke Oven Gas; Producer Gas; Blast Furnace Gas; Water Gas; Natural Gas.

(*b*) The trend of development in high or low temperature carbonization of coal.

(*c*) What is our present knowledge about the specific heat and heat conductivity of coal and coke?

(*d*) The principles of screening.

(*e*) Discuss the factors influencing the efficient blending of solid fuels.

(*f*) The fundamental principles influencing the segregation of coal in bunkers when filling or discharging.

(*g*) Possible developments in the use of petroleum gases.

Papers must be submitted to the Secretary of the Institute under a *nom de plume*, the name and address of the author being enclosed in a sealed envelope and sent with the Paper. Papers must be received by the Secretary on or before Sept. 1.

Papers must be limited to a maximum content of 6,000 words, and may be illustrated by line drawings or photographs.

In view of the widespread interest shown in the intensive study which the Institute is devoting during the present session to thermal insulation, it has been decided to extend the meeting arranged for May 31 at the Institution of Mechanical Engineers, Storey's Gate, S.W. 1, to a full-day conference, and to invite the members of all other Institutions, and Research and Trade Associations who may be interested to take part.

The opening item will be the presentation of a Paper by the President, Dr. E. W. Smith, C.B.E., which will summarize the eight papers on thermal insulation already presented to various Sections of the Institute during the present session. The opening Paper will be followed by a discussion, the early part of which will consist of specially invited contributions.

The remainder of the morning session and the early part of the afternoon session will be devoted to an open discussion, and the reply, which will be given in the later part of the afternoon, will be made by the various Authors of the Series of the Insulation Papers.

The list of papers in the Insulation Series is as follows: Thermal Insulation, by Dr. H. R. Fehling; The Economics of Saving Fuel, with Particular Reference to the Insulation of Steam Ranges, by G. N. Critchley; The Practical Aspects of Reheating and Heat Treatment Furnace Insulation, by A. Stirling; The Thermal Insulation of Buildings, by N. S. Billington; The Insulation of Open-Hearth Furnaces and Blast Furnaces, by Dr. J. M. Ferguson; The Insulation of Furnaces, by Dr. R. J. Sarjant; The Insulation of Pottery Furnaces, Kilns, and Carbonizing Plant, by J. S. F. Gard; and The Insulation of Boilers.

The Conference will open at 10.30 a.m. There will be an adjournment for lunch at 12.30 p.m., and the Conference will be resumed at 2.30 p.m. Those wishing to participate in the discussion should write to the Secretary, Institute of Fuel, 30, Bramham Gardens, S.W. 5, outlining the nature of their contribution and estimating the length of time it will take to present it, not later than May 17.

Society of British Gas Industries

The following awards of Silver Medals have been made by the Society of British Gas Industries to Authors of Papers given to Junior Gas Associations.

London and Southern District: C. A. Deas, of Tottenham, for Paper, "Notes on Retort House Operation and Control."

Manchester and District: D. M. Thompson, of Burnley, for Paper, "Gas Lighting—Consideration of the Factors Affecting its Future."

Midland: F. L. Atkin, of Birmingham, for Paper on "Infra-Red Drying: Experiments and Results with Gas-fired Equipment on High Speed Baking of Paint Finishes and other Drying Processes using Radiant Heat."

Scottish (Eastern District): Douglas W. Davison, of Inverness, for Paper on "The Removal by Liquid Processes of H_2S from Town Gas with particular reference to the Thylox Process."

Scottish (Western District): W. B. Wright, of Colvilles, Ltd., for Paper on "Industrial Instrumentation—Principles; Practice; Application."

Wales and Monmouthshire: W. R. Branson, of Cardiff, for Paper on "Post-War Domestic Fuel Policy with particular reference to South Wales."

Western: J. R. Martindale, of Bristol, for Paper on "The Maintenance and Working of a Fully Automatic Carburetted Water Gas Plant, with particular reference to Clinker Control, at Canons' Marsh Works, Bristol."

Yorkshire: W. T. Hird, of Sheffield, for Paper on "Selling a Temperature."

Works Regulations

At a recent meeting of the London and Southern District Junior Gas Association Mr. **A. G. Palmer**, B.Sc.(Eng.), A.M.I.Mech.E., Acting Works Regulations Officer to the Gas Light and Coke Company, gave a Paper in which he explained that, as he had experience both from running a works as well as specializing in Factory Legislation, he had come to realize how important and beneficial was this legislation, which he contended was a necessary part of an engineer's training.

It did appear strange, he said, that technical subjects were taught in all engineering courses, and in particular in Gas Industry courses, and yet immediately a young engineer was brought into industry he realized that he had certain legal obligations about which he knew nothing or next to nothing. The subject should be part of the engineering course, and should also form a part of the activities of their institutions.

"There are," continued Mr. Palmer, "two other classes of people to whom it should be taught—namely, apprentices, who are fully receptive when entering a works and will benefit through their subsequent life by a carefully indicated and illustrated talk; and foremen, whose co-operation and supervision are so necessary in carrying out the full requirements of the Acts."

He referred to the course run on behalf of the Factory Department by the Industrial Section of the Royal Society for the Prevention of Accidents. This course is designed to cover the following four approaches: (*a*) That of the factory inspector; (*b*) that of the successful practising safety officer; (*c*) that of the Trade Union ; and (*d*) that of the industrial psychologist.

"The information obtained of such a course," said Mr. Palmer, "is valuable to anyone, especially on the management side of industry, for much useful technical and administrative information is given by lecturers who really know their subjects." And finally he maintained that it was to the benefit of every engineer to follow carefully all the requirements of the Acts, as he would find that they consisted only of what was good practice in any reputable firm. It was to be regretted that some people endeavouring to escape their responsibilities had made it necessary to convert good practice into legal requirements.

Diary

May 12.—Manchester and District Junior Gas Association: Meeting in Liverpool. Paper by F. Bell (Liverpool).

May 14.—Women's Gas Council: Executive Committee, Gas Industry House, 12.45 p.m.

May 23.—B.C.G.A.: Meeting of Members in Scotland: Central Station Hotel, Glasgow, 2.30 p.m.

May 24.—Midland Association of Gas Engineers and Managers: Spring Meeting, Hinckley.

May 25.—North of England Gas Managers' Association (Auxiliary Section): Annual Meeting, Newcastle, 2.15 p.m.

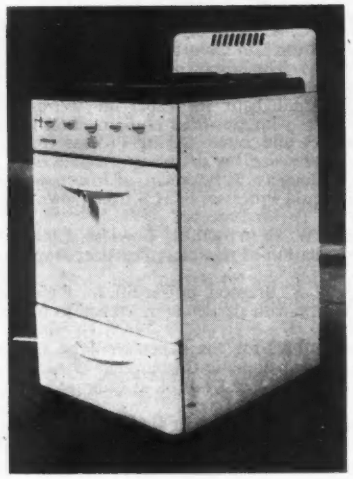
June 2.—Manchester and District Junior Gas Association : Visit to Partington Gas-Works, Manchester. Paper by T. B. Smith.

June 14.—N.G.C.: Annual meeting, Gas Industry House, S.W. 1, 10.30 a.m.

June 14.—Federation of Gas Employers: Annual meeting, Gas Industry House, S.W. 1, 2.30 p.m.

June 14.—B.C.G.A.: Annual meeting, Gas Industry House, S.W. 1, 11.45 a.m.

The American Temporary House



In last week's "JOURNAL" we referred to the first of the 30,000 temporary dwellings which the United States are sending to this country to help in the housing programme, and we mentioned that each house is to have gas for cooking and that the cooker will be of American design. Our photograph is of one of the 30,000 cookers to be installed. It is a streamlined model of fully pressed steel construction in black and white, manufactured by the Hardwick Stove Company, Cleveland, approved by the American Gas Association. It has four boiling burners, oven, and grilling or broiling chamber underneath the oven; overall dimensions are: height 3 ft., width 1 ft. 8 in., depth 2 ft. The hotplate is of black vitreous enamelled pressed steel with integral spill trays having four aerated boiling burners, with flash ignition to all burners. A black vitreous enamelled cast iron spider is located over each burner. A constant pressure governor is not included, neither is there a separate control cock for the flash ignition pilot. The oven is 16 in. wide by 14 in. high by 18 in. deep with a single aerated burner having side gas feed and top flue outlet. The rating is 21,000 B.Th.U. per hour. The linings are of pressed steel forming runners for the single welded wire oven shelf provided. The bottom lining is removable to allow access to the burner, which is provided with a lighting port projecting through the bottom lining. A safety tap for the oven is provided, together with four taps controlling hotplate burners on a panel above the oven. The oven appears to be fully lagged with slag wool and the door is hinged on the lower edge and check springs are provided; these springs are inclined to be fierce and return the door smartly back to the closed position from about 30° open. The flue from the oven terminates in a vertical grille at the back of the hotplate about 4 in. above the level of the hotplate; a thermostat is not incorporated. The broiling, or grilling chamber is situated immediately below the oven with sprung drop down door with similar characteristics to that of the oven.N The whole of this grilling compartment withdraws in the same way as a drawer, and a ribbed drip tray is provided capable of adjustment to three positions and incorporating a loose drilled enamelled plate to carry the food being cooked.

Awards for Safe Driving

Long-term Safety First driving awards were made to over 40 of the Gas Light and Coke Company's petrol and steam vehicle drivers and horse carmen at Gas Industry House on May 4. The presentations were made by Air Vice-Marshal Sir Philip Game, Commissioner of the Metropolitan Police, and the ceremony was presided over by the Governor, Mr. A. E. Sylvester, who said that similar awards had been made annually for the past 25 years, and it was therefore fitting that the Silver Jubilee should be marked by a more public rather than a domestic function. In addition to Sir Philip Game, Mr. Sylvester welcomed Mr. C. Dukes, General Secretary of the National Union of General and Municipal Workers, and Chairman of the Joint Industrial Council for the Gas Industry, and Mr. R. E. F. Howard-Hodges, Secretary of the London Council of the Royal Society for the Prevention of Accidents.

Two of the men, Mr. G. Bennett and Mr. H. J. Pridmore, received the coveted 25-year cross. Between them these two drivers have covered over a million miles without blameworthy accident. In addition to the 25-year crosses, medals and brooches were presented to other drivers who had completed periods of from five to 20 years of safe driving, and each man also received a cash payment from the Company.

During the past quarter of a century the Company's vehicles have covered over 100 million miles, and the Company has paid over £10,000 in awards.

In expressing thanks for his 25-year decoration, Mr. Bennett related how on one occasion in his early days he was caught in a speed trap while driving at 18 miles an hour when the limit was 12 miles an hour. When he appeared before the Bench one of the justices exclaimed: "This is terrible; something must be done to stop such furious driving."

Southern Association

A General Meeting of the Southern Association of Gas Engineers and Managers was held at Grosvenor House, London, on May 3, the President, Mr. R. C. TAYLOR (Torquay), presiding.

Mr. W. A. Howie (Maidstone), who for ten years had held the office of Hon' Secretary and Treasurer, and had been elected Vice-President at the last meeting, was unanimously elected President for the year from July, 1945, to June, 1946. In accepting office, Mr. HOWIE said he hoped it would be possible for him to entertain the members on President's Day at Maidstone. He also hoped to visit the Western District of the Association during his term of office.

Mr. F. Dawson (North Middlesex) was unanimously elected Vice-President, and other appointments were made as follows: Auditors, Mr. C. F. Botley and Mr. J. H. Donaldson; Hon. Secretary and Treasurer, Mr. J. M. Webber; representative on the Council of the Institution of Gas Engineers, Mr. Webber; Committee, Messrs. H. Versey, Noel S. Smith, and W. H. Wise (representing the Western District), T. C. Battersby, A. Tennant, J. W. Townsend, and N. Willsmer (representing the Eastern District), and Messrs. H. J. Escreet, J. H. Hornby, N. Humphrys, P. E. Browne, C. A. Deas, and W. K. Tate, together with the President, Vice-President, last three Past-Presidents, and Secretary, *ex-officio*, and the chairmen and secretaries of the Eastern and Western Districts.

The PRESIDENT made a token presentation to Mr. Howie to mark his retirement as Hon. Secretary of the Association since Jan. 1, 1935, and Secretary of the Eastern District since Jan. 1, 1934. Mr. Taylor said Mr. Howie had given most generously of his time and considerable experience to the work of the Association, and the success of their meetings and social gatherings had been in no small measure due to his untiring efforts in the careful preparation of the arrangements. Speaking from personal experience he knew the value of his assistance and guidance, and he was sure the past-Presidents would endorse those remarks.

Mr. HOWIE, in responding, spoke of the great pleasure he had derived from his work, and he looked forward to extending the circle of his friendships during his year of office as President. He paid tribute to the help he had received from Mr. Howcroft, of Gravesend, who had greatly assisted him in the routine work of the Association, and he was glad to announce that Mr. Howcroft had agreed to carry on his work with Mr. Webber. The actual presentation, of which his own salver had been a token, was to take the form of a grandfather clock.

The routine business was followed by an Address by Mr. A. E. SYLVESTER, Chairman of the British Gas Council and Governor of the Gas Light and Coke Company—see p. 595.

Aerex, Limited, previously a holding company, has now been broadened in character to concern itself in trading and has taken over the business of Aerex Fans (Branch of Colliery Engineering, Ltd.). This arrangement has in view extensions in the fan developments, both in this country and overseas.

The Annual Meeting of the Illuminating Engineering Society will be held at the Institution of Mechanical Engineers, Storey's Gate, S.W. 1, on May 15, at 5 p.m. An Address on "Daylight and its Penetration into the Sea" will be delivered by Dr. W. R. G. Atkins, O.B.E., F.R.S.

A New Branch of the Women's Gas Council has been formed at Cannock and the inaugural meeting was held on April 17. Miss Joan Bushnell, who has recently joined the Headquarters Staff of the Women's Gas Council, spoke on Kitchen Planning. The Dowager Lady Halberton has consented to be President and Mrs. Burrell Davis Chairman. Mr. T. E. Parry, Manager of the Cannock and District Gas Company, is co-operating in the work.

Gas Undertakings' Results

Australian Gas Light Company.—Gas sales in 1944 amounted to £2,697,107, and a balance of £409,724 was carried to profit and loss account. After payment of interest, the net profit carried to appropriation account was £297,536. A final dividend of 3%, making 5¼% for the year, has been declared, leaving a carry-forward of £59,130, against £16,743 brought in.

Maidstone Gas Company.—A final dividend of £7 9s.%, the same as for the first half of the year, was declared at the annual meeting on April 26. Net revenue for 1944, after providing for debenture interest and all other expenses, amounted to £14,076, which, with the amount brought forward, made a balance of £18,763. Dividend payments leave a balance of £6,416 to be carried forward. Gas sales during the year amounted to 2,984,893 therms, compared with 2,851,771 therms in 1943, and 2,441,632 therms in 1940.

Montevideo Gas and Dry Dock Company.—At the annual meeting on May 15, the Directors will recommend payment of a final dividend of 3%, free of tax (2% payable in May and 1% payable in December), making a total of 4% for the year ended Dec. 31, 1944.

The War is Nearly Over—So What?*

By A. E. SYLVESTER, F.C.A.,

Chairman of the British Gas Council; Governor and Managing Director of the Gas Light and Coke Company

WHEN you kindly suggested some months ago that I should address a meeting of this character, I felt at once that it was a very signal honour for one who makes no pretence of being an engineer of any sort to be asked to address such a gathering of engineers. I felt it was an honour that I could not possibly refuse, although I had no idea at that time how terrifying it was going to be. Not only did I feel it was an honour at that time, but, as your President has so kindly reminded you within the last few weeks, something else has happened which has in a large measure added to my own work and responsibilities. I have been elected Governor of the Gas Light and Coke Company, and that, of course, is a tremendous thing for me personally. It is a job I have to try to do to the best of my ability, and I feel that as this is the first occasion since that happened—in fact it is really the first occasion I have ever had as yet of addressing a representative gathering of persons engaged in the Gas Industry—it would be only fitting, and I know you will appreciate my reasons, if before I come to the real subject of my talk I pause for a moment to pay a tribute to that great man to whose work I have succeeded, but whose place I can never take. The name of Sir David Milne-Watson has been one to conjure with not only in the affairs of our own Industry, but in public life in general in this country for a good many years. This is not the time or place, nor am I the proper person, to go into great detail as to his work and achievements for the Industry, but I must acknowledge what I owe personally to his kindly help and encouragement. It is for those of us who are younger, perhaps not so much younger as we should like to be, to carry on from where the great men who have preceded us have left off. Although we might like to change some things, it is not in any spirit of criticism of their work, or because we think they were wrong, but if we are wise and sensible we shall appreciate and adopt the work they have done, and regard it as a firm foundation on which to build for the future.

Action Rather than Talk

Now that the war is virtually over I feel this is the time when we have to think in terms of action, and perhaps not talk quite so much. There are a great number of things to be done, and the future of the Industry will depend not on what we say but on what we do. I do not want this afternoon to get involved in any talk about the ownership of the Industry. I think it is best to regard that side of the future as, what it has in fact become, a political issue. Speaking from the point of view of our own national body, the British Gas Council, it is far better that that Council, which contains representatives of both municipal ownership and company ownership, should not attempt to fight one another or even discuss the problem of ownership, but that in our national body we should confine ourselves to the problems which affect the Industry as an Industry, irrespective of its ownership or of political issues. On a basis like that we shall be able to go forward with unity, and shall not run the risk of a division of councils on the matters which really and truly affect the Industry as an Industry.

Looking to the future I think it is generally accepted that the key-word to the success of the Industry is Service. Above everything else the thing that really matters is the effect on the public mind of the service that can be offered, service in the broadest possible sense, the quality of the gas, the pressure, the kind of apparatus they get, the courtesy they receive from our representatives, the way bills are presented, and everything that counts as service in the widest sense. Looking at the matter from the consumer's angle it seems to me you can really divide service into two main parts. There is the technical side of service and there is the economic side. Whatever it is that an industry sells, however perfect the product may be, it will not meet with a ready sale unless it is sold at the right price and on terms that people can readily understand. So two things must go together. We must not in any way skimp the service we give, but we must be quite sure that we charge for it fairly and properly. I do not presume to address you on the technical side, but there are a few things I would like to say on the economic and financial side with reference to the consumer. On recent occasions I have said that I believe that one of the most important things we ought to be clear about is the relation of price to cost, and from time to time people have said to me, What exactly do you mean by that? It seemed to me that this would be a suitable opportunity to talk about that at greater length than I have previously had any chance of doing, and I want to say at the outset that the subject is a very big one and a very complicated one, and even if I take up all the time allotted to me I cannot hope to do more than scratch the surface.

Accountancy, costing, and finance are subjects on which my whole business life, training, and experience, if they have fitted me for anything at all, give me a right to speak. I would not presume to address you on any technical or engineering problems, but on a subject of this sort I ought to be able to say something which might help you in your various undertakings. The first thing that strikes us in considering the question of price is the tremendous variation there is up and down the country in the forms in which gas is offered to the public. It is almost impossible to find two undertakings with an identical form or series of tariffs. There is a tremendous difference all over the place, and there may be very good reasons why there should be variations in one part of the country as against another, but it surely must be evident that where we have more or less the same circumstances ands till have these variations in the methods of charging for gas, some must be right and some must be wrong. There must be something that we ought to be able to say is somewhere near the right thing. The way I look at it is this. In any gas undertaking—in fact I will go further and say in any kind of industry—the right way to found your business is on the basis of cost. If you are making different classes of goods you must, if your business is to be properly founded, see that each class of goods pays what it ought to pay, not only covering the cost of the service it gives but contributing something to the profit of the undertaking. When that does not apply it must mean inevitably that some of your customers are being charged too much and some are being charged too little, and so long as you are in a competitive market it must follow that the customers who are being charged too much will tend to look elsewhere for their supplies. Not only that, but if you so organize your affairs—and I am speaking broadly at the moment—departmentally or in classes the cost for each one stands on its own feet, and you can in the future look to the business building up in whatever way happens to be best and most suitable without putting your finances out of gear. If, on the other hand, you have a department where for some reason or other you are not correctly relating your price to cost and are charging too little for that deparment's goods it is going to have a bad effect on the rest of the business. Some customers will be paying for others.

Individual Costing

The whole of my business experience has taught me that a business founded on those principles endures, and one that does not follow those principles almost always finds its way to the bankruptcy court sooner or later. It so happens that in our Industry we are not quite in the same position. I do not mean that we are not competing with one another, but one undertaking is not competing with a similar class of undertaking, and so the effects of unsound financial structure do not follow so noticeably; but what does happen is that some undertakings find themselves with a schedule of prices entirely out of line with their neighbours, and the public begin to feel—and this is where the point of goodwill comes into it—that there is something wrong. The biggest asset we have in our Industry, or that is possessed by any other industry, is one which very rarely figures in any balance sheet. It is known as goodwill, and goodwill is largely founded upon your consumers believing that you are treating them fairly. That is a great business principle and there is nothing theoretical about it. It so happens that a couple of evenings ago I was looking through that admirable booklet prepared by Cadburys giving their experiences over the 20 years between the two wars. I strongly recommend that booklet, which is easy to read and has many good diagrams, to you all; it will well repay your study. One thing chimed in with my views, and I will read you a little of what they say about their own problems in this respect. In dealing with correct costing they say: "In the development of an active sales policy the question of price occupied the key position. In this respect commercial enterprises have followed differing principles. It is not sufficient for the selling price of a firm's products as a whole to show a satisfactory margin of profit over the cost of production. Every line in the price list must make its proper individual contribution to the total profit, otherwise some lines will be subsidizing others, which will not benefit either the firm or its customers. The responsibility for ensuring that lines are correctly priced rests with the costs office and the manner in which it co-operates with the sales departments has already been described." The description appears earlier in the booklet, and they go on to speak of the way in which they periodically, very frequently in these days, bring their costs up to date, and say that the relation between price and cost is always maintained, and at the end of the section they say: "During the past decade these considerations have increasingly influenced the firm's trade policy. Having kept prices in line with costs it has endeavoured first to sell all lines at weights which the public can readily understand and test, and secondly to sell them at the more popular prices. This has meant that in adjusting prices to costs it has frequently been necessary to make use of a third alternative, that is that

* Address to the Southern Association of Gas Engineers and Managers, May 3, 1945.

of making some alteration in the packing or wrapping or presentation sufficient to take up the slack." The whole point of this came so aptly after what I had decided to say to you that I felt I must quote it. This matter of the relation of price to cost is of the utmost importance from the point of view of the practical future of our Industry. I attach the greatest possible importance to it.

I was very interested this morning to hear Sir Hubert Houldsworth speaking of the time when a new vision is needed, and rather surprisingly he spoke of this new vision in terms of 1895, and he referred to some experiments for the more correct measuring of the quality of gas. That struck me as a very important thing, because it is clear that in the minds of the scientists the correct measurement of small quantities and finding out what they mean is looked upon as a matter of major importance. It seems to me that the new vision we need in this Industry at the moment in order to carry us forward into the future is a new vision with regard to the economics of our Industry, and it is rather overdue. I would not like to suggest that in doing that we should ignore or in any way retard what is happening on the scientific and technical side, but I do think that in addition to that we should turn our attention to a new vision with regard to our costs and prices.

The Basis of Costing

I would like to say a few things about the basis of costing. In costing gas there are really three major components. You could, of course, divide them into all sorts of subdivisions, but there are three major items. The first is the cost of manufacture; the second is the cost of distribution—the physical distribution of the gas from the works to the consumer—and the third is the cost of administration and service. Those three together make up the total costs of a gas undertaking, and consequently added together they give us the figures on which our price must be based. The point I want to make is that it is not sufficient to add them together and say they give us our total price. It must be broken up, and instead of working back from the total price you should begin at the other end and work upwards from the ground, basing your costs on the factors in each of the three categories. These three components of the cost, taking pre-war experience, are something of this order. I am speaking for the south, and there are no doubt variations in the Midlands and the north, but taking our experience round about London the figures are something like 50% of the total cost for manufacture, 15% for the physical distribution of the gas, and something of the order of 35% for administration and service. That is roughly the sort of position, with of course minor variations, in the London District.

Let us begin with the costs of manufacture. They contain six principal elements, and I hope you will forgive me if I am rather elementary in dealing with them, but in building up a thing like this you must begin at ground level. There are six items: Raw materials, process costs, repairs and maintenance of the fabric of the whole plant and everything, renewals and depreciation of the same, the overheads on the works, and interest on the capital employed. I think there is very little difficulty in sorting out the costs into these heads, with one exception. In conference from time to time with people in the Industry I have come to the conclusion that there is a good deal of confusion of thought with regard to repair and renewals. They are two entirely separate things. Repairs and maintenance mean everything connected with the cost of keeping the plant and fabric in repair as it is, but renewals and depreciation, the one or the other, is the cost of pulling the whole plant down and putting up a new one. The two things are quite distinct, and the second must be provided for on top of the first. The one does not take the place of the other. However well you may repair and maintain the plant, some day it comes to the end of its useful life, and it is because of that that you must have the two separate things running in parallel. In some cases (very often in the Gas Industry) the second is charged as renewals. In other cases the cost has been met by depreciation allowance, or by a fund which provides for the cost of renewals as they come along. I do suggest that where you adopt the renewals system you find your accounts much easier to work over a long period, and the system will give you better results if you provide for renewals year by year, setting aside an equalizing fund rather than leaving it till the plant is to be renewed and you are faced with a large expenditure, with nothing provided to meet it.

If in our business, as it is done in some businesses, you can run your plant throughout, say, a whole year on a more or less equal basis, then there is clearly—and I am speaking only of this first component of the cost—no justification for differences in price structure at that stage. Every unit you manufacture will cost you the same. The reason why in our Industry we are justified even at this first stage of price structure in making a difference in our costs is because of the load factor, and I want to spend a little time speaking about load factor, which is another subject on which there seems to be a good deal of confusion.

Load Factor

The first thing I want to say about load factor may appear to make confusion worse confounded. I think I ought to tell you that I have come to the conclusion that there is no such thing as load factor. On the contrary, there are hundreds of them. There are all sorts of load factor, and the danger arises when one gets hold of one particular load factor and uses it to answer problems to which it is not properly related. Each one is useful only for a particular purpose and is misleading and untrue for any other purpose. There are two main divisions into which you might divide load factors. There is the load factor relating to the manufacture of the gas, and there is the much more difficult and nebulous one relating to distribution. I want to deal for a little while with the first one, because in many respects it is by far the most important. The first and most important is what, for my own purpose, I call the plant load factor. That is the load factor relating to plant, and which contrasts the average make of the plant with the capacity of that plant over a period of 12 months. Twelve months is taken because very obviously you get the whole seasonal variations, and it is best done on the basis of 24 hours, because in 24 hours again you get the full cycle of its operations. In that connexion I would like to say a word about so-called storage. Storage in our Industry is not the same thing as is normally understood. We do not do the same sort of thing as, for instance, the squirrel. We use our holders as a means of evening out the load during the period of 24 hours. Sometimes it extends beyond the 24 hours, and sometimes in times of peak demand the holder enables you to keep going over a period of as much as a week by evening out the load during that period. But for the purpose of assessing the plant load factor there seems no better basis than the 24-hour period. The 24-hour basis can be considered in this way. You take the average 24-hour make over the whole 12 months and contrast it with the total capacity of the plant, also calculated on the 24-hour basis. In calculating that capacity we come up against difficulties at once which show how misleading it can be to compare what at first sight seems to be a very simple thing, because there is no agreed definition of the capacity of the plant. A good many different figures would be put up by different people on the capacity of a plant. No doubt you could get somewhere near it, but I suggest that this question of load factor, as it becomes more important, should be studied. I should like to make the suggestion that in this Association or in the Institution some study of this subject of the capacity of the plant for the purpose of assessing load factor should be made so that the plant load factor for different undertakings could be arrived at on a comparable basis. I am certain that we should all benefit by an exchange of views on figures that are really comparable. There is a great deal to be learnt from plant load factor, and a great deal cannot be understood without it.

In making a definition of the capacity of the plant I would not leave out the possibility that for short periods in times of emergency the plant may work at an overload. I would not attempt to make a definition covering the overload; the normal capacity is, I think, the right figure to take.

Still continuing on the manufacturing side, when we have got the plant load factor we have not by any means finished, because another load factor immediately crops up, and that is what I would call the delivery load factor. To get that you take the figure representing the average day's delivery and you compare it, not with the plant capacity, but with the maximum day's delivery. That is where I think some people often fall into error, because they quote the definition relating to plant load factor and then take the figure for the delivery. It could by a freak happen that the one might correspond with the other, but normally the delivery load factor is something which looks better than the plant load factor, and because of that it is liable to be misleading. The difference between the two is obviously the difference between the maximum day's delivery and the capacity. Although you have cases where plant does just what is required of it and turns out its full capacity when needed, in a plant of any size or in a complex organization where there are many different plants you will always find a margin is necessary for plant not available for some reason or another. I rather stress this point because of the importance of distinguishing between these two different figures which really do mean different things.

There are further load factors connected with the manufacturing side. These are the factors connected with the consumers, because each consumer has a factor of his own, and these combine into group load factors. These are what I call consumer load factors, and you will realize that when you add them together you do not get the same as the delivery load factor, because the peaks may not occur all at the same moment.

I would like to go back to the plant load factor because in arriving at the proper cost of this first component in the price of gas the only variation we can admit is one that is derived from plant load factor. If the load was equally spread throughout the year there would be no justification for any difference in the price of gas as it leaves the works, because the station engineer is not in the least interested in who takes it. If it is going out equally every therm is the same as every other therm. It is only when you get seasonal variations in rate that you get difference in costs. That has to be measured by reference to the first of the load factors to which I have referred, the plant load factor.

Taking 1938 as the last pre-war year we found from our own experience in the Gas Light and Coke Company that our plant load factor as a whole was 52%. The delivery load factor was better than that; it was 56%, and that 56% is roughly supported by figures of delivery load factor which are given in Field's *Analysis*. We had, as I have said, in 1938 a plant load factor of 52%, which means that

taking the year as a whole the plant was working at a little over half its capacity. Such a thing as 100% is out of the question. There has to be time for resetting and renewals and so on, and so far as I can see, although the figure of 52% may appear low, and I would like to see it higher, you will find that in many cases it is difficult to get very far beyond 60%.

We found by analysis that beginning with the plant load factor of 52%, if we could have increased that load factor by as much as 25%, making it up to 77%, the reduction in the cost of gas leaving the works would be of the order of 10%. We do not put it any higher than that. On the other hand, if the plant load factor were reduced by 25% to a total of 27% the cost goes up by very much more than that. It goes up 20 to 30%. It is rather difficult to understand at first, but I think it really means that at 100%, which is a theoretical and not a practical maximum, you would still have considerable costs. If you go the other way, to zero, your figure is infinity. Instead of having a straight line up and down you get a curve. This, of course, is an important matter in considering future business, and the sort of loads it is profitable or important to take.

Coming to the consumers, I would like to tell you a little about that side. We have made careful investigations into load factors. We have taken separate classes of consumers, and there we find that the three classes of consumers who give the best factors and have a consumer load factor of over 60% are, with us, the prepayment consumers, the industrial consumer, and the catering consumer. On the other hand, the consumer with a low load factor is undoubtedly the consumer who takes gas for space heating in the winter. Looking at space heating as a separate load we are quite satisfied, and this has been checked by reports from heating and ventilating engineers as well as from American statistics, that the space-heating factor taken alone is certainly not more than 25%, which is a very low figure. It is therefore most important that this load should "lean up" against other loads.

Distribution Costs

I would like now to say a word about distribution costs. These I do find exceedingly difficult, and for the life of me I do not see at the moment how to assess load factor for distribution systems. The difficulty is that in the works you can measure everything and you know where you are, but with a distribution system, particularly if it is a big one and complex, the conditions are different at the end of every street. You have not got a cohesive thing to tell you whether it is right or not. No distribution system, except on paper, is going to be quite occupied at every point. It gets overloaded at one point but it might still be underloaded at another, and I find it a difficult matter to relate a distribution load factor of any kind to the question of price. I realize that a distribution system must be so devised that it can take variations in demand on practically an instantaneous basis, and it is the one species of load factor with which the electricians have to cope. They have not got the manufacturing load factor that we have got, which is a tremendous advantage to us and makes a tremendous difference to the load factor overall. You may have noticed that in a recent speech Mr. Harold Hobson, of the Central Electricity Board, said that the load factor on the grid system was 35–36% before the war. That would be a disturbingly low factor for us. My feeling about distribution in relation to costs is that it would be extremely difficult to justify in detail a different charge for different classes of consumer. I believe in that case you have to take a broad view of your distribution system, and I think the fairest and best thing to do is to total up your charges for the physical distribution of the gas and to charge it to consumers without variation. At present I know of no circumstances that would justify a variation that one could support in any impartial enquiry: I know, of course, that the consumer just outside the gate of the works does not cost as much as one situated ten miles away, but you have to supply all your consumers, and you cannot very well give any special benefit to the man who happens to live next door. I think the reasonable thing to do is to take your distribution costs and charge them at so much per therm without any variation.

Administration and Service

We now come to the third component, administration and service. Here we are on what is for an accountant more familiar ground. This is straightforward text-book costing. All you have to do is to take the expenses incurred in administration and services, which really means you must cover everything not covered by the other two components, and work out as best you can how much each class of consumer should contribute. Just to give you an idea of what is in my mind, I feel strongly that the industrial consumer who takes a substantial load and gives you no trouble afterwards should pay very little under this heading. You will find it very difficult to justify a large increase beyond the cost of manufacture and the cost of distribution. The addition to that should be small, and I think if as an Industry the charges are worked out on their merits, we shall be able to hold our own and increase our industrial load very considerably. There is no doubt at all that the greater part of our administration and service costs are caused by and should be paid for by the domestic consumer, and I think there is no difficulty in that. What I am pleading for now is a more orderly presentation of our costs so that we know precisely what we are doing and why we are doing it, and if all undertakings worked on the same sort of principles, although they would get different results, we should have a bedrock on which we could more closely relate this matter of charges. We should also be able to judge better what methods gave the best results.

I know it is sometimes felt that by increasing consumption per domestic consumer tremendous cuts in these administration and service charges could be made, but it is one of the most difficult questions and you cannot generalize about it, but only go by experience. It depends entirely upon what the additional business is and whether in fact it does or does not increase your expenses. If you can double your business without increasing expenditure obviously your overhead percentage is halved. I think the plain question to be answered is what happens, not what may happen, and I feel we have a long way to go before we are really able to answer that question with any certainty.

In costing your various loads according to the sort of principles I have tried to enunciate you should not be too optimistic about holding your overheads where they are, nor need you be unduly fearful. I believe there is undoubtedly a considerable economy in administration and service to be made by increasing consumption per consumer, but I do not think you can increase it without incurring some substantial additional costs.

How are you going to increase consumption, and what particular appliances are going to be used? Take water heaters for instance. We have not yet solved the problem of maintaining them cheaply. So long as the cost of maintenance is as high as it is you would be doing a very foolish thing in making a charge that did not cover the maintenance. Somebody else would have to pay. Let us try and so arrange the revenue of our undertakings that each grade of consumers pays its appropriate contribution, and that one does not subsidize another.

Two-Part Tariffs and Block Rates

Now a word about two-part tariffs and block rates. I prefer to use the word tariff as indicating any form of charge, and rate as indicating a particular form of it. I feel that if you can find out and satisfy yourself as to what is the right amount per therm you need from a particular class of consumer you begin with that. I think it is quite right to take into account the fact that a larger consumption undoubtedly reduces your overheads. My present feeling is that the fairest thing to all consumers is to have a block rate so that those who take more do get some benefit; they get gas at a cheaper rate as they burn more. On the other hand there are some consumers who would like to have a two-part tariff, but it should be based on the same principles. The two are really interchangeable; they are only two ways of expressing the same thing in a different form, and they can be made to give exactly the same revenue.

My feeling with regard to the future of our domestic business is that it should be based on a simple block rate with not more than three stages in all, with an alternative two-part tariff for those who prefer it. The two should give similar results at each stage of consumption.

The views I have given you are in one sense my personal views, but they are formed in collaboration with a team of able and enthusiastic helpers in the Gas Light and Coke Company. I hope they have given you some food for thought. We regard this question of the relation of price to cost as one of the most important questions for the Industry to face. There is, too, something behind all this, because I believe that the enunciation of these principles on behalf of the Industry may well lead to their ventilation by the public and the electrical industry, and I beg you to think that over, because I believe the electrical industry will, in the course of time, land into serious trouble from its neglect of these principles. We cannot afford to wait until they run into trouble, and what I am hoping we shall do as an Industry in the next few months is to try to awaken the public to the inequality and unfairness, especially so far as the lighting load is concerned, of the exploitation of a monopoly by the electrical industry. Their industrial charges will also bear looking into.

I believe I have said enough to give you some idea that in regard to the future of the Gas Industry I stand as an unrepentant optimist, not the sort of optimist who thinks the way is going to be easy, but as one who sees the difficulties, but feels that with good team work and clear thinking we shall succeed.

Vote of Thanks

Mr. R. C. TAYLOR (President) said it would be generally agreed that Mr. Sylvester's address had been full of experience and encouragement for the future, and it would be well worth careful study when they read it in the "JOURNAL."

Mr. S. E. WHITEHEAD (President of The Institution of Gas Engineers), in proposing a vote of thanks to Mr. Sylvester said that they were mainly engineers, but it was quite clear that they could not afford to ignore those highly complicated administrative matters that Mr. Sylvester had made his particular study for so long and in which he was such an expert. They were dependent on him and other experts in his particular profession to enlighten them on these matters. In the

past they had had to take a good many risks, and he was afraid that in the future they would have to take many more. Mr. Sylvester had given them what was probably an ideal and at the same time very practical lines on which to run their business. Although he, too, was an optimist, he could not help feeling they had a great many difficulties ahead, and they would have to take such risks as the laying of free mains to housing sites in order to get business. Mr. Sylvester's Address would help them to preserve a proper balance and to keep their final goal in view. He congratulated him on his election as Governor of the Gas Light and Coke Company, and he was sure they were all grateful to him for his inspiring leadership as Chairman of the British Gas Council. He had had the good fortune to work with him for some years on various committees. He had done a tremendous amount of work for the Industry and towards its unification. It was amazing the amount of time he put into various committees and the reports and details he brought forward for their help. They all deplored the fact that Sir David Milne-Watson had had to retire owing to ill-health, but in Mr. Sylvester he had a very worthy successor and they were deeply grateful to him for his work and for the assistance he gave them.

Colonel C. M. CROFT (Senior Vice-President of The Institution of Gas Engineers), in seconding the vote of thanks, said two records had been set up, one in that that was the first occasion on which the Governor of the biggest gas undertaking in the world had addressed that district Association, and second in that an accountant had held the interest of a gathering of engineers without the slightest flagging of interest.

Mr. SYLVESTER, in a brief reply, said he hoped no one would go away feeling that what he had said amounted to a policy of safety first. It was not that at all. He was fully aware of the difficulties that lay ahead. There were rocks ahead, but the more rocks there were the more he thought they would be well advised to be quite sure that they had good maps and charts in their chart room.

New C.W.G. Plant at Johnstone

Many prominent officials of the Scottish Gas Industry were present at the opening ceremony on April 25 of a new fully-automatic carburetted water gas plant installed at the Johnstone Gas-Works. Erected by Messrs. Humphreys & Glasgow, Ltd., the plant has a capacity of 600,000 cu.ft. of gas per day, and a relief holder with a capacity of 30,000 cu.ft. has been built by Robert Dempster & Co., Ltd., of Elland.

The opening ceremony was performed by the Provost of Johnstone, Mr. W. B. GIBSON, who explained that the works were taken over by the Town Council in 1897, and in the first year of Town Council ownership the sale of gas was under 19 million cu.ft. It was now in the region of 1 million cu.ft. per day. Such expansion called for constant watchfulness on the part of the Gas Committee and its Manager, and in this respect Johnstone Town Council had been very well served. They had never hesitated to install new plant whenever it had been considered advisable for the improvement of the Undertaking and for the benefit of the consumers of gas.

At a luncheon following the opening ceremony, Sir ALEXANDER TAYLOR, K.B.E., praised the Johnstone Town Council for its progressive policy, and felt sure that the installation of the new gas plant would prove a sound policy. Ex-Provost Ross, in reply, said the installation of the new plant was an indication that Scottish boroughs were fully alive to the needs of the future. In this connexion he praised the initiative and foresight of Mr. Jamieson, Manager of Johnstone Gas Department, and Bailie Smith, who had taken such a keen interest in the scheme.

Replying to the toast of "The Contractors," Mr. W. G. HEAD, of Messrs. Humphreys & Glasgow, said that on visits to Scotland and elsewhere he had always been impressed by the efficiency shown in running many of the smaller gas concerns. Johnstone gas officials obviously knew their work, and in their hands the new gas plant would yield the best results. Speaking on behalf of Messrs. Robert Dempster & Co., Mr. ERNEST KING referred to the smooth way in which the entire work of construction had gone through.

Water Treatment

No. 39 in the series of Fuel Efficiency Bulletins issued by the Ministry of Fuel and Power deals with the subject of water treatment. It can be had (free of charge) from the Ministry at 2, Little Smith Street, Westminster, or from any Regional Office of the Ministry. The booklet sets out the main objects of water treatment, the principal of which is to maintain steam-raising plant in good running order by the prevention of scale and/or corrosion in the boiler and auxiliary plant. A brief description of the compositions of the three main types of natural water supply is given. The three types are (*a*) well or spring waters (including waters from the deeper levels of coal pits); (*b*) moorland waters (that is, surface drainage from moorland); and (*c*) surface waters (canals and rivers not in moorland districts).

The next step is a description of the four methods of treatment: (i) internal, (ii) external, (iii) conditioning, and (iv) electrical treatment. Then there is a page on boiler blow-down, followed by a chapter on corrosion and the places in which it can occur in steam plant. Another section provides a quick guide to the routine control of the water treatment decided upon, and the final section refers briefly to the removal of oil from water, and the question of water polluted by bacteria and other organisms. Although it does not go into any great detail the booklet gives quickly the broad picture of water treatment.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

Extensions at Blackpool

On April 14 the Blackpool Gas Committee decided to ask the Finance Committee for authority to apply for a loan of £130,000 to cover extensions at the new Works at Marton which, at a cost of £440,000, were opened in 1940.

It was stated by the Gas Committee's Chairman (Councillor S. Morris) that it was intended to stop the manufacture of gas at the Princess Street Works, and in order to do this it would be necessary to carry out extensions at Marton.

With the opening of the Marton Works, designed to meet Blackpool's needs to the end of this year, the Princess Street works stopped manufacture, but by 1942 the Marton Works were producing to capacity. To meet the increased industrial calls of the town, the Princess Street Works were reopened. Now it is intended to close Princess Street Works, and remove the plant to Marton, and also to purchase additional plant to meet present and post-war requirements.

Post-War Prototype Houses

For the first time since 1939 the house-building industry as an industry is to build 30 pairs of houses which will demonstrate to the public of this country the improvements the industry hopes to introduce in post-war houses, despite the fact that the price of these houses —the sort every young married couple wants—will still be reasonable.

The National Federation of Registered House-Builders, which sponsored the scheme, have formed a Standing Committee on which are represented all the leading industries which contribute towards house-building. The building of the 30 pairs of houses will be preceded by a competition among those builders whose names appear on the register of the National House-Builders' Registration Council.

The project has the approval of the Minister of Works, and licences for the building of the houses will be granted as soon as the winning plans have been approved. The competition for the designs closes on June 30, and it is hoped that the 30 winning builders will be able to start building within six weeks of the closing date. The houses will be built in thirty different areas in England and Wales, and when completed will be open to inspection by the public, who will be asked to criticize them. Among the members of the House-Building Industries' Standing Committee are the British Gas Council, the Cast Iron Heating Boiler and Radiator Manufacturers' Association, and Coal Utilization Joint Council. The Chairman of the Committee is Mr. A. W. Curton, of the National Federation of Registered House-Builders.

The following recently issued British Standard Specifications may be obtained on application to the Secretary, Institution of Gas Engineers, 1, Grosvenor Place, S.W. 1:—B.S. 1211: 1945, centrifugally cast (spun) iron pipes; price 2s. net, post free. B.S. 1221 : 1945, steel fabric for concrete reinforcement; price 2s. net, post free. B.S. 341 : 1945, valve fittings for compressed gas cylinders; price 2s. net, post free.

An Address, illustrated by lantern-slides, was given in the Gas Showrooms recently by Mr. T. E. Parry, General Manager of Lichfield Gas Company. During the course of his lecture Mr. Parry gave definitions of coal from a geological, a palaeobotanical, and chemical point of view. He said the future demanded a planned national fuel policy. The necessity of balanced economy and an increase of exported products indicated the processing of coal by carbonization. By this means, he stated, the value of the by-products, drugs, dyes and plastics was such that employment could be found for 11 men in place of 6 for an equivalent amount of coal now being used in the raw state. He remarked that a co-ordinated national fuel policy would place gas and electricity in their proper sphere in relation to the life of the nation, and prevent misuse.

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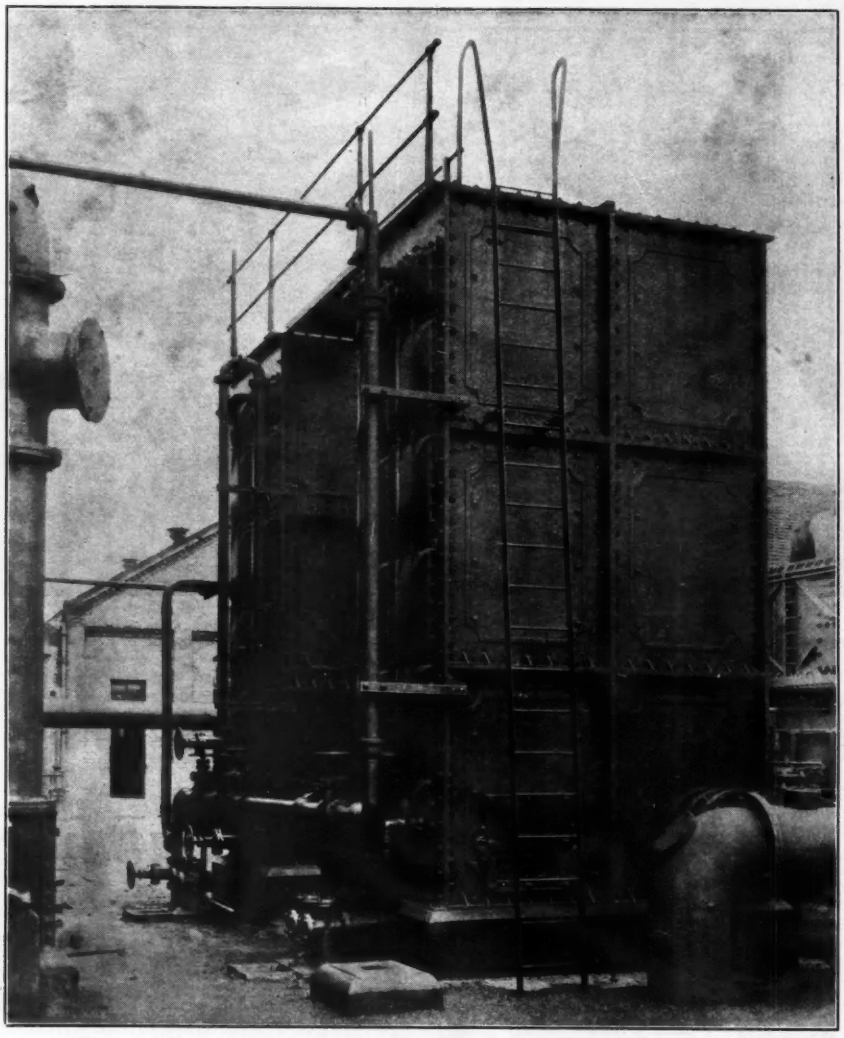

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Forty Years of Gas Fire Progress*

Standards of Performance

By ARTHUR FORSHAW, M.Sc., Chief Chemist, R. & A. Main, Ltd.

IN the normal course of events we should, in pursuit of perfection in domestic appliances, have been working on some problem the attempt to solve which would probably have provided subject-matter for presentation and discussion. However, as you probably know, any research work done during the last few years has been, at least so far as my firm is concerned, on entirely different subjects, unsuitable for immediate disclosure, if at all. Thus hampered I was obliged to select something as appropriate as possible to this period of pause between the end of one peace and the beginning of another. So I come to the present title, for it seemed to me that we may well consider the state of perfection of some gas-heated appliance, the stages through which we have passed to approach this and the methods by which assessment may be made, while we are resting from one period of advance and gathering together our energies for the eagerly awaited next period.

When first I entered the gas appliance industry, over 35 years ago, the principal subject of improvement and research was the gas fire. The turnover from the deep mass of fireclay fuel to the shallow single radiant fire had just started, and it is noteworthy that this advance was practically coincident with the first publication of serious research work on gas fires, and a short while later of a method of assessing the output of radiant heat—*viz.*, the Leeds method of 1909. Until this date nothing but qualitative tests of heating power had been put forward, and it was practically impossible to measure in any exact manner the progress, or otherwise, represented by alterations to the various parts which go to make up a gas fire. Publication of the Leeds method altered that, and put into the hands of appliance makers a powerful quantitative weapon of which they took full advantage, as contemporary records of the next few years show.

What sort of an advance has been made in the forty years between 1905 when perhaps the first stirrings of a forward movement began, and to-day, when an entirely different scheme of utilizing the heat of combustion *via* a gas fire is pushing up behind the barriers imposed by the war, and awaiting their removal to flood the heating field and attempt to prove its superiority?

By 1905, although cast-iron frets were still to be found, their earlier predominance had given way to the so-called "ball" and "skull" fuels of fireclay laid in a deep mass in the fire. These were retained by a heavy cast-iron fret and heated by poorly aerated bunsen burners, placed, usually, below and near the front of the mass. A high degree of incandescence was often attained, but the radiant efficiency was low, varying probably between 20% and 30% reckoned on the gross calorific value of the gas. In the more expensive models the low radiant efficiency was supplemented by convection from devices which gave a comparatively small volume of air at a high temperature, and which, as they were so placed as to become dusty, eventually gave rise also to smell. A further characteristic of this type of fire was the small flue outlet to the chimney and the consequent lack of ventilating effect, or even the actual escape of combustion products where the fire was backed by a piece of sheet iron to fill up the grate opening, as it nearly always was.

Reliable comparative figures of performance for these fires are not easy to find. The first ones available were given by J. H. Brearley (*Trans. Inst. Gas E.*, 1907). He had no absolute method of determining radiant efficiency, but evolved a standard procedure for getting comparative readings from fires in position in front of a coal grate. The readings were made by means of a Rubens thermopile (an instrument afterwards utilized in the original Leeds method of determining radiant efficiency), and they were corrected in each case to a consumption of 100 cu.ft. of gas.

Brearley did, however, attempt to determine directly both flue heat and convected heat, and anyone interested in fire development will find in his Paper some information about the type of fire then in use. His results lead to certain conclusions, which in turn foreshadow future developments in practice. Thus, a fire with a depth of fuel of 5½ in. backed by air-tubes (H.41, Table I) was, after testing, altered to a solid back (H.45) and the depth of fuel successively reduced to 3½ (H.49) and 2 in. (H.53), the back brick being thickened to make up the original depth of 8 in., the comparative radiation being determined at each stage. Subsequently tests of first and last state were made to ascertain the convected and flue heats and, by analysis, the percentage of flue gases which did not go up the flue but escaped in the front of the fire. Some results from Fire H. at equal consumptions read :

With another fire he contrasted the effect of reducing the gas rate over the whole of the fire with the effect of using a duplex burner—

Fire E.	Normal bunsen	18.0 cu.ft./hr. gave a "Comparative Radiation Value" of 136.
	All turned down	9.0 cu.ft./hr. gave a "Comparative Radiation Value" of 102.
	Duplex only	8.9 cu.ft./hr. gave a "Comparative Radiation Value" of 139.

A reduction of 25% when turned down.

As comment on this one may say that the whole trend of fire progress since that date has been away from the deep bed of fuel to the shallow single radiant with duplex burners for the larger fires, and now, with all-gas burner fires, towards a still shallower radiant surface.

Further, the by-passing of products into the room was looked on as quite a normal occurrence at that date, and Brearley remarked, "when carrying out the tests for waste heat and heated air (flue heat and convection), a portion of the products by-passed up the front of the stove canopy; but analysis and observation have led to the conclusion that, with the stoves used, this would occur in any normal circumstances." Later in the same connexion he says: "Still . . . the rapid changing of the air contents of the room (over twice its volume per hour with Fire E) kept the air satisfactory." Point is added to these observations when we learn the actual size of the flue outlets on the half-dozen fires shown in Table II.

* Paper to the Scottish Junior Gas Association (Eastern and Western Districts).

TABLE I.—BREARLEY'S FIRE H. EFFECT OF THINNER BED OF "FUEL." GAS RATE 25 CU.FT./HR.

State.	Test.	Figure for radiation.	Heat in Flue (F). %	Heat in Air (C). %	F+C.	100—(F+C).	Waste products by-passed %
Fuel 5½ in. thick backed by air tubes	i. 41	47	—	—	—	—	—
	ii. 27/28	—	11.1	—	59.8	40.2	—
	iii. 14	—	—	48.7			(34.8)
Fuel 5 in., backed by 3 in. file	i. 45	59	—	—	—	—	—
Fuel 3½ in., tile 4½ in.	i. 49	82	—	—	—	—	—
Fuel 2 in., tile 6 in.	i. 53	102	—	—	—	—	—
	ii. 33/34	—	25.9	—	45.7	54.3	—
	iii. 17	—	—	19.8			(24.5)

Also shows how results in Table II are compiled from separate tests.

TABLE II.—SOME OF BREARLEY'S GENERAL RESULTS COMPARED.

Fire.	Rate at 20/10 w.g. (60° and 30 in.). Cu.ft./hr.	Area of fuel. Sq. in.	Figure for radiation.	Flue. Area. Sq. in.	Flue. Heat (F). %.	Convection. Vol. cu.ft. at 62°F.	Convection. Heat (C). %	C+F.	100—(C+F).	Waste products by-passed. %
D	24.8	49	134	1.8	15.8	5,050	41.9	57.7	42.3	(27.7)
E	16.2	56	133	6.1	26.3	4,120	33.5	59.8	40.2	(32.6)
F	12.3	42	123	3.3	30.2	3,500	30.2	60.4	39.6	(23.5)
G	15.6	60	108	6.5	27.1	8,520	20.8	47.9	52.1	(28.8)
H (41)	25.0	68	47	7.0	11.1	5,270	48.7	59.8	40.2	(34.8)
H (53)	25.0	68	102	7.0	25.9	3,840	19.8	45.7	54.3	(24.5)
I (3 in. fuel and air tubes)	23.1	48	84	7.0	7.6	4,510	36.9	44.5	55.5	(33.9)
J (condensing stove)	11.1	—	111	0.44	9.8	4,270	44.5	54.3	45.7	(52.5)

The C.V. varied from 590 to 613 gross at 60° and 36 in. The test-room = 2,030 cu.ft. gross volume. F was determined calorimetrically—presumably flue "pull" reduced by cooling; C by anemometer and thermometer.

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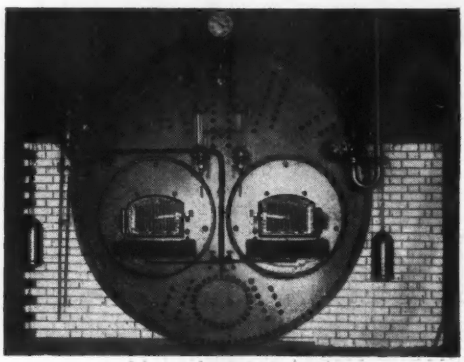

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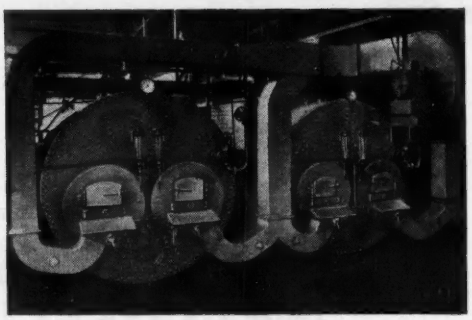

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TABLE III.—Some Glasgow Results Compared.

Fire.	Rate.	Figure for radiation.	Flue. Air, cu.ft. at 62°F.	Flue. Heat (F) %.	Convection. Air, cu.ft. at 62°F.	Convection. Heat (C). %.	F+C.	100−(F+C).	Waste products by-passed. %.
1	19.8	86	6,440	30	6,279	7	37	63	(1.2)
2	21.5	81	7,993	52	8,210	19	71	29	(.72)
3	40.0	70	14,181	59	8,762	13	72	28	(.82)
4	30	91	9,810	27	9,096	23	50	50	(2.8)
5	34	90	7,884	29	9,040	10	39	61	(5.0)
6	33	135	7,050	35	9,217	16	51	49	(21.0)
7	42	120	8,913	26	10,231	29	55	45	(19.0)
8 (ball fuel)	42	91	11,592	58	1,657	6	64	36	—

The C.V. was 623 gross. The rooms = 1,708 or 1,630 cu.ft. gross volume. F and C were determined by anemometer and thermometer.

These tables are not Brearley's, but are compiled from his results, and the object of giving them apart from the points already mentioned is to show so far as possible the state of the fires available at that date and the difficulties of testing them. It will be observed that, assuming the propriety of adding flue and convected heats together, from results obtained on separate occasions the difference between such a total and 100—*i.e.*, the heat unaccounted for by test—does not bear much relation to the radiation computations. It is evident that the methods leave much to be desired, since the heat unaccounted for is practically double what our knowledge of these fires tells us must have been their figure for radiant efficiency.

After Brearley there appeared in 1909 a Report to the Glasgow Corporation by a panel of its officials entitled "The Effect on the Atmosphere of the Use of Gas Stoves in Dwelling-Houses." I allude to this and quote some of the results because they were obtained in conditions of practice in some rooms in two houses in Glasgow. Here, again, nothing but comparative radiation figures obtained from thermopile readings were given (but on a different basis from Brearley's), and it will be seen in Table III that they suffer the same disabilities as those of Brearley. When we come to the flue and convected heats, however, the tremendous draughts in these rooms are apparent, and the high percentage of heat pulled up the flue and the consequent small percentage of convected heat, even with the small flue outlets of the contemporary fires, is instructive, and adds point to my remarks on modern fires and their heating performance which will be made later.

The unfortunate fact that Brearley and the Glasgow experimenters and the Gas Heating Research Committee at Leeds, whose results will be next considered, all took every precaution to disguise the make and details of the actual fires used, for at that time doubtless excellent, reasons, makes it difficult to draw all the conclusions one might other wise do about the fires of that period. Coal fires were also taken into consideration in the Glasgow Report, and the statement was first made, I believe, on evidence, that "at least 75% of the total heat generated by the combustion of coal in an ordinary domestic fire is lost in the form of flue heat."

The publication of the first Gas Heating Research Report in 1909, with the establishment of a reliable method of estimating radiant efficiency, removed one of the testing difficulties, and in that and the following Report (1910) results for radiant efficiency and flue heat were determined, while convection, if estimated, was taken as the difference between their total and 100—a practice that has continued until the present owing to the manifest difficulties of separately, and accurately, determining the convected heat.

The fires mentioned in the 1909 Report are transition types between the deep fires of 1905 and the shallow single-radiant fires which eventually completely ousted them. They had one shallow row of fuel with a flame to each piece, but the fuel was not self-supporting, was no more than 4 or 5 in. high, and was followed by one or more rows of cross-laid fuel. Rather higher radiant efficiencies were shown in the 1910 Report, partly in consequence of improvements in the details of the Leeds method and partly, no doubt, because some slightly more modern fires were also tested. Typical results are quoted in Table IV, but it must be remembered that flue draughts were often controlled by a fan, while that used by Brearley was the natural one due to a 22 ft. chimney flue, but cooled to some extent by his method of estimating flue heat.

TABLE IV.—Some Gas Heating Research Committee's Results Compared.

Report.	Gas rate at 60° and 30 in. Per fire. Cu.ft./hr.	Per flame. Cu.ft./hr.	B.Th.U. gr./hr.	Radiation on net C.V. %.	Air up flue at 60° and 30 in. Cu.ft./hr.	Flue heat. %.	Convection (by difference). %.
1909	18.9	2.70	1,532	35.3	2,251	45.1	19.6
	19.2	2.74	1,663	31.0	1,883	37.8	31.2
	19.4	2.80	1,624	27.4	530	21.4	51.2
1910	19.1	2.73	1,643	36.9	—	25.4	37.7
	20.4	2.92	1,646	40.0	—	41.7	18.3
Full	16.8	2.40	1,544	37.7	—	38.7	23.6
Duplex	9.6	3.21	1,941	36.9	—	36.5	26.6

The C.V. averaged 590/600 B.Th.U. gross at 60° and 30 in.

Turning-down versus *Duplex Burners* (1910 *Report*).

Full on	18.01 cu.ft./hr.	Radiant efficiency	37.7%
Turned down	9.62 "	" "	30.7%
Duplex	9.75 "	" "	36.9%

A reduction of 18.5% when turned down.

In the 1910 Report the effect of varying the consumptions is shown—"The stove used was one of the most 'modern' types, having long columnar fuels." The figures are reproduced in Table V, and those from a "modern" fire of about four or five years later are also given for comparison. The results well illustrate the advance made in efficiency during that period.

TABLE V.—Effect of Varied Gas Rate (C.V. 573/4 at 60° and 30 in.).

1910 Report. Rate at 60° and 30 in. Cu.ft./hr.	Per flame. Cu.ft./hr.	Efficiency %. (on net C.V.).	Later results (say, 1913–14). Rate at 60° and 30 in. Cu.ft./hr.	Per flame. Cu.ft./hr.	Efficiency %. (on net C.V.).
19.35	2.42	38.1	15.1	2.16	40.7
25.31	3.16	41.1	17.0	2.42	42.3
26.42	3.30	41.5	18.9	2.70	44.1
30.96	3.87	42.8	20.3	2.90	44.2
37.22	4.65	38.6	22.1	3.14	45.6
			24.3	3.45	48.8
			25.7	3.68	49.1
			27.6	3.95	48.0

The heat going up the flue is seen (Table IV) to be a greater proportion of that generated than in the Brearley results. This was to be expected, because later types of fires were tested and these probably had more effective flue outlets, one being quoted as 4½ in. by 1⅛ in. = 4.78 sq. in. for a gas rate of about 18 cu.ft. at 60° and 30 in., while, of course, a fan was used in the 1909 experiments.

These results are confirmed by some taken shortly afterwards from fires current about 1910/11. They also give the flue outlet areas, and an indication of the "hygienic efficiency" of the fire from the escape of CO_2 from the canopy edge when used without any flue pipe or chimney draught. It will be seen that with one exception there is a rough inverse relation between area and escape. It will be noticed that input has slightly increased.

TABLE VI.—Radiant Efficiency and "Hygienic Efficiency" of 1910/11 Fires. (Pre-*Lancet*.)

Fire.	Rate, 60° and 30 in. Cu.ft./hr.	Radiation (on net C.V.). %.	Flue area. Sq. in.	Excess CO_2 at canopy edge. Pts./10,000.
A.	24.2	48.8	9.4	*Nil.*
B.	24.6	42.3	4.0	13
C.	—	39.2	7.1	14
D.	24.6	38.1	6.5	0.7
E.	24.9	36.3	7.0	1.0
F.	25.7	34.3	7.7	0.5

C.V. 570/600 B.Th.U. gross at 60° and 30 in. With exception of C there is a rough inverse relation between area and escape. Note also increased inputs against Table IV.

Up to this point I have been dealing mostly with the deep fires or the transition fires in which long self-supporting shallow fuels had not reached their best form. My recollection of radiant efficiency in the best fires current in 1909/10 is a figure of 42% on the C.V. Intensive work done with a view to improving this raised the efficiency to about 48/50%, or say 43% on the gross C.V.* Tables V and VI show this increase. Fire A in Table VI is probably rather later than the others shown there, but practically all fires soon reached this output, which became the standard during the next 10 years. Briefly stated such increases were mostly due to lightening the radiants (as the "fuel" was now more appropriately called); opening their fronts while closing their backs; improvements in back bricks; improvements in burners, whereby advantage could be taken of aerated flames which had been avoided earlier because of their noisiness; other alterations. The following 10 to 15 years saw revision of the radiants and their fitting to the brick and, mainly by the exclusion of excessive secondary air, a further increase in radiant efficiency was achieved, so that by 1935/36 the most modern fires were showing 45/50% on the gross C.V.

* Originally all radiant and other efficiencies were based on the net C.V., which, as the difference between net and gross is neither manifested nor recoverable in this type of heating, is logical. Since gas has been sold on its gross heating value, this has been substituted as the basis of calculation; thus all early published results require a deduction of approximately 10% to make them comparable with those of to-day.

(*To be continued*)

GAS PRODUCTS PRICES—STOCKS AND SHARES

The London Market May 7.

As from March 5, by the Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), the maximum price of Pitch for briquetting has been increased to 60s. per ton f.o.r. supplying works, and the prices for Road Tar, as fixed by the Coal Tar Products Prices Order, 1943, S. R. & O. No. 1528, have been increased by one half-penny per gallon. There is also an increase of 5s. per ton in the price of standard Creosote/Pitch Mixture.

The prices of other products are unchanged.

Control of Benzole and Coal Spirit Order, 1944 (S.R. & O. 1944, No. 172), is in force.*

By this Order the price of Motor Benzole is fixed at 2s. per gallon. The Order also lays down the method of evaluating Crude Benzole, and calls for periodical returns to the Ministry of Fuel and Power from all producers of Crude and Refined Benzole.

Control of Toluene (No. 4) Order, 1944 (S. R. & O. 1944, No. 170), contains an amendment of the Control of Toluene (No. 3) Order, 1943.

There is also the Control of Benzole and Coal Spirit (No. 2) Order, 1944 (S. R. & O., No. 988).

Coal Tar Products Prices (No. 2) Order, 1944 (S. R. & O., 1944, No. 1051), allows increases in the maximum prices for all forms of Naphthalene.

* Slightly amended by Control of Benzole and Coal Spirit (No. 2) Order, 1944.

The Provinces May 7.

The average prices of gas-works products during the week were : Pitch and Crude Tar,* Toluole, naked, North, 90's, 2s. to 2s. 2½d., pure, 2s. 9d. (now controlled by S. R. & O. 1944, No. 988, operative from Sept. 1, 1944. Benzole and Coal Spirit, also Coal Tar Naphtha and Xylole, are now controlled by the Control of Benzole and Coal Spirit Order, 1944, dated Feb. 18, 1944, S. R. & O. 1944, No. 172, operative from March 1, and S. R. & O. 1944, No. 988, part 1, operative from Oct. 1, 1944, Carbolic acid, 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil controlled by the Coal Tar Products Prices Order, 1943, dated Oct. 20, 1943 (S. R. & O. 1943, No. 1528), operative from Nov. 15, 1943, Naphthalene now controlled under S. R. & O. 1944, No. 1051, operative from Sept. 22, 1944.

Attention is called to Coal Tar Product Prices Order, 1945 (S. R. & O. 1945, No. 229), referred to on p. 305, "JOURNAL" of March 7.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Scotland May 5.

Deliveries continue at a steady pace. Refined tar*: Yield to Distillers is 5d. per gallon *ex* Works naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d.; hydrogenation oil,* 5⅞d.; low gravity or virgin oil,† 7¼d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works naked according to quality. Crude naphtha†: 6½d. to 7d. per gallon. Solvent naphtha*: Basic prices delivered in bulk, 90/160 grade, 2s. 8d., and 90/190 Heavy naphtha, Unrectified, 1s. 10½d.; Rectified, 2s. 2d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

The good war news appeared to be too much for investors last week, and there was a general hesitancy and lack of support with dull markets. Even British Funds weakened, but one or two groups in the industrial section showed some resistance to the general position, although the trend of most prices was downwards.

Business in the Gas Market was only on a slightly reduced scale, and although it will be seen below that a few reactions were recorded, with one exception these occurred in the stocks of those companies operating abroad. As also did the feature of the week, which was the rise of 10 points in Oriental stock, while in the Supplementary List Cheltenham ordinary gained 7.

The following are the price changes during last week:

PROVINCIAL EXCHANGES

Bristol 5 p.c. max.	120½—121½	+½
Ditto 5 p.c. Deb.	123—125	+2
Chester Ord	115—117	+1½
Newcastle Units	26/6—27/-	—/3d.

OFFICIAL LIST

Alliance & Dublin	115—120	—2
Bombay	44/—47/-	—
Brighton Cons.	107—112	+1
Commercial 5 p.c. Deb.	112—117	+2
Imperial Continental	117—120	—1½
Montevideo Ord. (x.d)	87—90	Apl. 30
Oriental	165—170	+10
Primitiva Holdings	12/6—13/6	—/3d.
Uxbridge	125—130	+2

SUPPLEMENTARY LIST

Cambridge Cons. "B"	143—148	+3
Cheltenham Ord.	110—115	+7
North Middlesex 5 p.c. Pref. (x.d.)	110—115	Apl. 30

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"THEORY OF INDUSTRIAL GAS HEATING," by Peter Lloyd. Second Edition. Completely revised and greatly extended.
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APPLICATIONS are invited for the above position at a commencing Salary of £600 per annum, inclusive of present war bonus.

Candidates must be Corporate Members of The Institution of Gas Engineers with previous experience of Gas-Works Management, Gas Distribution and Sales.

Applications and Testimonials should be addressed to the undersigned for receipt not later than May 19, 1945.

The South Midland Gas Corporation, Ltd., Therm House, St. Aldates, Oxford.
ALEXANDER TRAN, General Manager.

SENIOR DRAUGHTSMAN required by London Gas Undertaking. Good knowledge of all types of Gas-Works plant essential. Salary £9-£10 per week, including Cost of Living Bonus. Excellent prospects.

Applications, giving full details of Experience and position under the Essential Works Order, to No. 9431, "GAS JOURNAL," 51, High Street, Esher, Surrey.

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APPLICATIONS are invited for the positions of DISTRIBUTION SUPERINTENDENT and MAINS AND SERVICE SUPERINTENDENT to the Gas Undertaking.

The selected candidate for the post of Distribution Superintendent will be responsible for all the distribution work from the meter inlet on the consumers' premises, and candidates for this post must possess the Higher Grade Certificate of The Institution of Gas Engineers (Supply), and have had a sound technical and practical experience in the distribution and application of gas for domestic purposes. They must also be fully conversant with the sales of appliances to consumers, and capable of supervising the personnel in the fitting and maintenance of appliances. Salary £360, rising by three annual increments of £15 to £405 per annum, plus war bonus of £59 19s. per annum.

Candidates for the post of Mains and Service Superintendent must possess the Ordinary Grade Certificate of The Institution of Gas Engineers (Supply) and must be fully conversant with both high and low pressure systems. Salary £285, rising by two annual increments of £15 to £315 per annum, plus war bonus of £59 19s. per annum.

Applications endorsed "Distribution Superintendent" or "Mains Superintendent," stating Age, Training, Experience, Qualifications and position in relation to the National Service Act, accompanied by three recent Testimonials, should be delivered to the Gas Engineer and Manager, Town Hall, Blackburn, not later than Wednesday, May 23, 1945.

CHAS. S. ROBINSON, Town Clerk.

COUNTY BOROUGH OF STOCKPORT

(GAS DEPARTMENT)

APPLICATIONS are invited for the position of ENGINEERING ASSISTANT at the Portwood Gas-Works, Stockport. Candidates must have had a thorough experience in the design and construction of Gas-Works plant, be capable of taking charge of the Drawing Office, and have passed the Higher Grade Examination of the Institution of Gas Engineers in Gas Manufacture, or its equivalent.

The Salary to be paid is in accordance with the Corporation Scale P.T.A. "D": £360 to £405 per annum, plus War Bonus (at present £59 16s.).

The appointment will be subject to the provisions of the Local Government Superannuation Act of 1937, and the successful candidate will be required to pass a Medical Examination.

Applications, stating Age, Experience, Qualifications and present position, and enclosing *copies* of three recent Testimonials endorsed "Engineering Assistant," should be received by the undersigned not later than Monday, May 28, 1945.

Town Hall, Stockport.
ARTHUR BOND, Town Clerk.
May 3, 1945.

CITY OF SALFORD

APPOINTMENT OF SHIFT FOREMAN

APPLICATIONS are invited for the Position of SHIFT FOREMAN in the Gas Department at a maximum Salary of £360 per annum plus bonus, which, at the present time, is £59 16s. per annum.

The shift will constitute eight hours and the 3-week cycle is as follows: 7 shifts, 7 shifts, 6 shifts.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the person selected will be required to pass a medical examination. The appointment will be terminable by one month's notice on either side.

Candidates should state the period of notice required to terminate their present appointment, and their position in regard to Military Service and the Essential Work Orders.

Applications, stating Experience, Age, etc., and accompanied by *copies* of not more than three recent Testimonials, must be delivered to the Gas Engineer (D. V. Lewis), Gas Offices, Bloom Street, Salford, 3 Lancs, not later than the first post on Monday, May 28, 1945, the envelope to be endorsed "Shift Foreman."

Canvassing, directly or indirectly, will be a disqualification.

Town Hall, Salford 3.
H. H. TOMSON, Town Clerk.

KETTERING GAS COMPANY

DISTRIBUTION

APPLICATIONS are invited for a SUPERINTENDENT, to act in the first place as Assistant for a short time, at a commencing salary of £350 per annum plus £50 War Bonus.

Applicants must possess a good theoretical and practical knowledge of the distribution and application of gas for domestic, commercial and industrial purposes, and be capable of supervising the department, advising consumers and preparing estimates.

Applications, stating Age and position in relation to National Service, accompanied by *copies* of three recent Testimonials, are to be delivered to the undersigned by May 24, 1945.

40, High Street, Kettering.
J. F. LORD, Manager and Secretary.

THE NORTHAMPTON GASLIGHT COMPANY

SHIFT ENGINEER

THE Company invite applications for the position of SHIFT ENGINEER.

Applicants must have had practical and technical training in Gas Engineering and experience in the working of Vertical Retorts and Carburetted Water Gas Plant, Purification and Benzole Extraction.

Salary will be £350 per annum inclusive of War Bonus.

Applications, accompanied by Testimonials, stating when able to commence duties, to be addressed to:

Northampton Gaslight Company.
H. BANKS, Chief Engineer.
May 1, 1945.

THE NORTHAMPTON GASLIGHT COMPANY

ASSISTANT WORKS SUPERINTENDENT

THE Company invite applications for the Position of ASSISTANT WORKS SUPERINTENDENT.

Applicants must have had practical and technical training in Gas Engineering, and experience in control and maintenance of Vertical Retorts and Carburetted Water Gas Plants and machinery and a knowledge of Purification and Benzole extraction.

The commencing Salary will be £375 per annum inclusive of War Bonus.

Applications, accompanied by Testimonials, stating when able to commence duties, to be addressed to:

Northampton Gaslight Company,
H. BANKS, Chief Engineer.
May 1, 1945.

BOROUGH OF OLDBURY

(GAS DEPARTMENT)

SHIFT SUPERINTENDENT

SHIFT SUPERINTENDENT required. Applicants should have a practical knowledge of gas-works plant and routine and be experienced in the working of continuous vertical retorts (preferably Glover-West) and Carburetted Water Gas Plant. Salary £300 per annum plus war bonus, at present £59 16s. per annum.

Applications, stating Age, Experience and Position under Essential Works Order should be received by the undersigned not later than Monday, May 28, 1945.

Municipal Buildings, Oldbury.
ARTHUR CULWICK, Town Clerk.
May 2, 1945.

COUNTY BOROUGH OF WIGAN

(GAS DEPARTMENT)

DEPUTY DISTRIBUTION SUPERINTENDENT

APPLICATIONS are invited for the position of DEPUTY DISTRIBUTION SUPERINTENDENT, at a salary of £240 per annum, plus bonus, rising, subject to satisfactory service, by two annual increments of £15 and £10 respectively, to a maximum of £265 per annum plus bonus, which bonus is at present £59 16s. per annum.

Applicants should have experience in high and low pressure distribution systems and a progressive sales policy with costing system. The person appointed will be required to prepare plans of mains, services and record distribution work.

Applications (on forms to be obtained from the undersigned), stating position with regard to the Essential Works (General Provisions) Order and Military Service, and accompanied by *copies* of not more than three recent Testimonials, should be delivered to me not later than Thursday, May 31, 1945.

Town Clerk's Office, Municipal Buildings, Wigan.
WILLIAM HENRY TYRER, Town Clerk.
May 7, 1945.

THE CARMARTHEN GAS COMPANY requires a DISTRIBUTION MANAGER to look after the Sales and Distribution side of the Undertaking under the supervision of the Engineer and General Manager. Some knowledge of drawing and chemistry would be an advantage.

Applications, stating Salary required, and position in relation to Essential Works Order, should be addressed to the undersigned.

Carmarthen Gas Company, Gas Works, Morfa Lane, Carmarthen.
K. E. TIDDY, Engineer and General Manager.

APPOINTMENTS WANTED

CHARTERED GAS ENGINEER, aged 41, with 24 years' experience of manufacture, distribution and sales, large and medium-sized works, desires change. Present position Engineer and Manager 85 million works. Address No. 9434, "GAS JOURNAL," 51, High Street, Esher, Surrey.

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COUNTY BOROUGH OF BIRKENHEAD

(GAS DEPARTMENT)

10 IN. HIGH PRESSURE MAIN

THE Corporation of Birkenhead are prepared to receive Tenders for the supply of 2,125 yards of 10 in. HIGH PRESSURE GAS MAIN with mechanical joints delivered on site where required. Particulars may be obtained from the Gas Engineer, Gas Offices, Hind Street, Birkenhead.

Tenders, sealed and endorsed "Tender for Gas Main," to be sent to me in a plain envelope which does not bear any name or mark indicating the sender not later than 5 p.m. on Friday, May 18, 1945.

Tenders not complying with this condition will not be considered. The Corporation do not bind themselves to accept the lowest or any Tender.

Town Hall, Birkenhead.
E. W. TAME, Town Clerk.
April, 1945.

URBAN DISTRICT COUNCIL OF KIRKBY-IN-ASHFIELD

OVERHAUL AND REPAIR OF GAS-WORKS PLANT

THE above Council invite Tenders for OVER-HAULING AND REPAIRING the following Gas-Works Plant:

Retort House Hydraulic Main.
Vertical Water Tube Condenser.
Livesey Washer.
Tower Scrubber.
Purifier Boxes.

Specification of the Work and Conditions of Tender may be obtained from the Council's Gas Office Manager, Mr. L. H. James, Public Offices, Kirkby-in-Ashfield.

Tenders endorsed "Repairs to Gas-Works Plant" must be enclosed in a plain sealed envelope, and should reach the undersigned not later than June 4, 1945.

The Council do not bind themselves to accept the lowest or any Tender.

Public Offices, Kirkby-in-Ashfield, Nottingham.
FRANK BOWMAR, Clerk of the Council.
May 2, 1945.

Get in on the Under Belly of RUST (Engineers' Enemy No.1)
Years of Wear instead of Weeks
GRANT & WEST LTD.,
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Steel Wires, Ropes & Cables running in and out of Water, Gas, Sulphurous Fumes, etc. will never RUST if treated with
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RUST KILLS ROPES — but ROPRES rope preservative KILLS RUST. Use ROPRES
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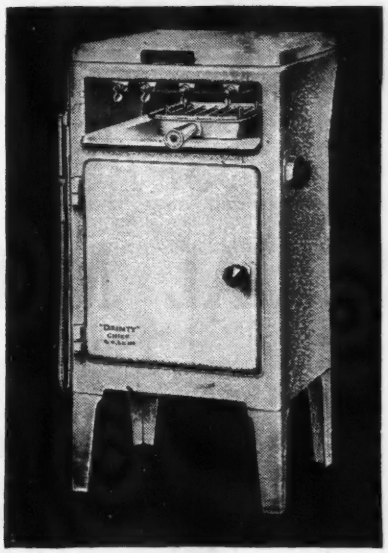

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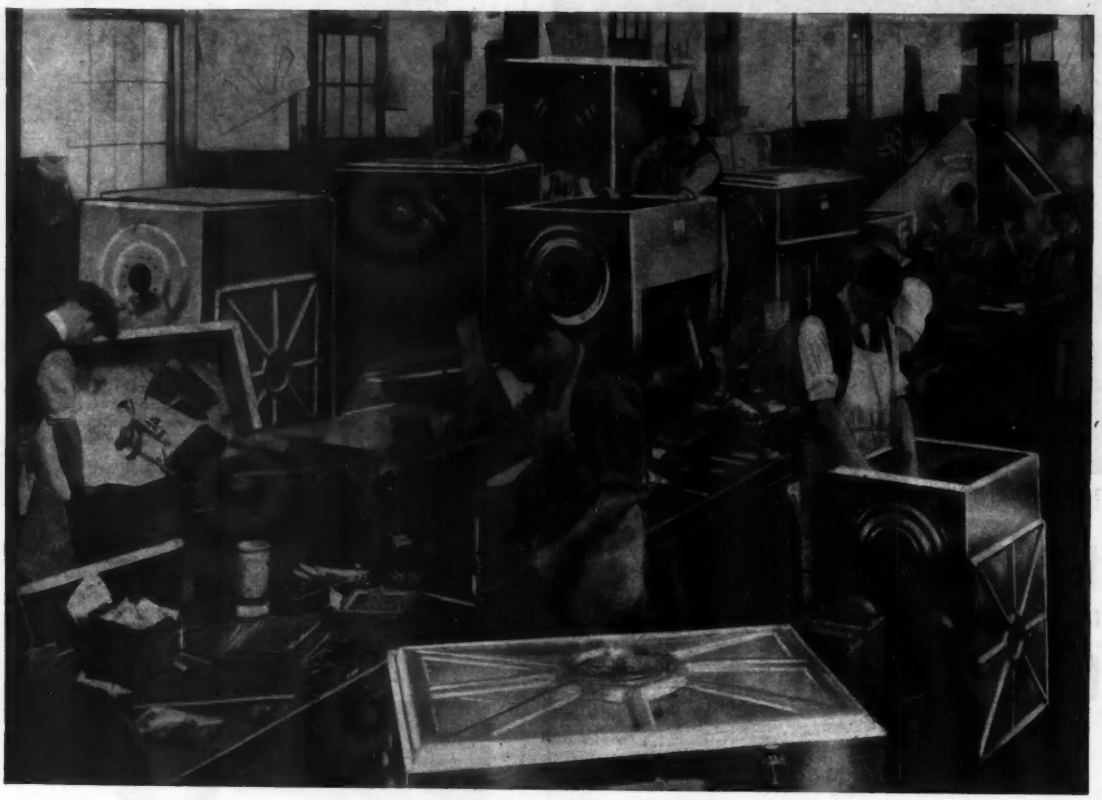

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for TAR

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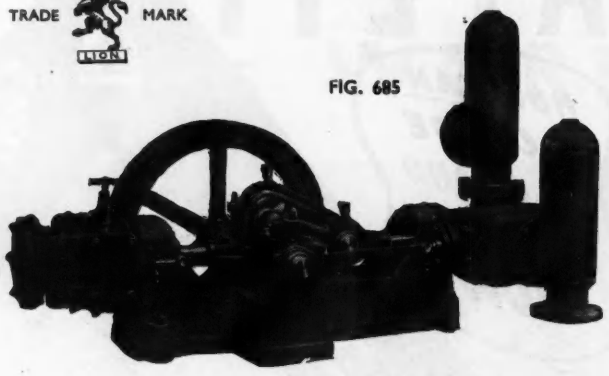

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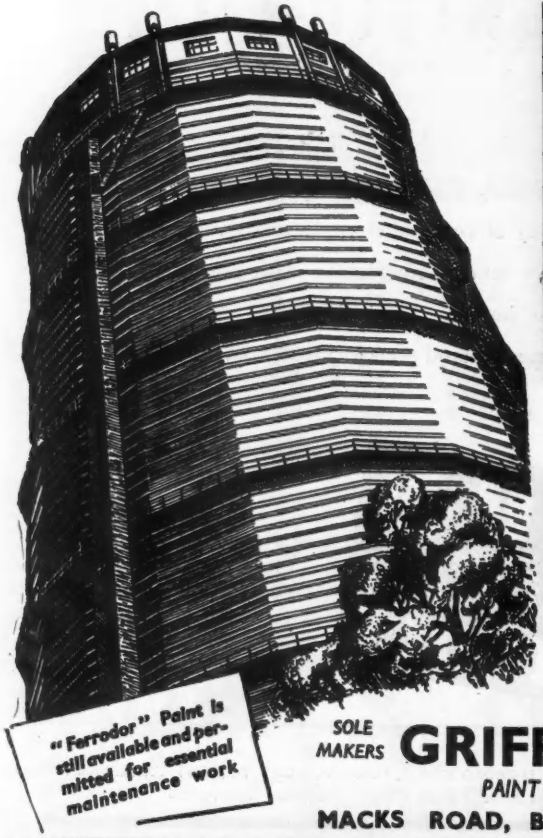
London Office: KERN HOUSE, 36 & 38, KINGSWAY, W.C.2. Wires: "Dryesbo, Westcent." 'Phone: Holborn 1091.



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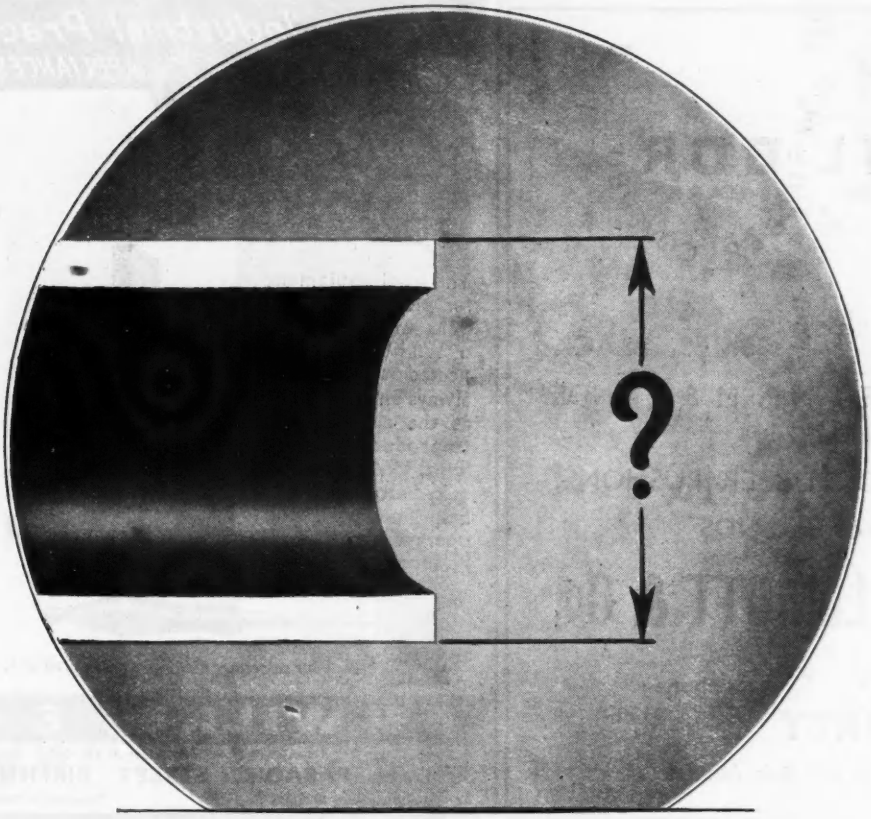

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demand the maximum output of steel tubes, which is made possible only by manufacturing each size in large quantities.

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We offer our full collaboration with your engineers in the choice of tubes, preferably at an early stage of design.

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FLEXIBLE TUBING "FULBOR" TRADE MARK RUBBER COVERED

MADE IN $\frac{5}{16}$" & $\frac{3}{16}$" SIZES, BLACK FINISH, FITTED N.P. M & F ENDS

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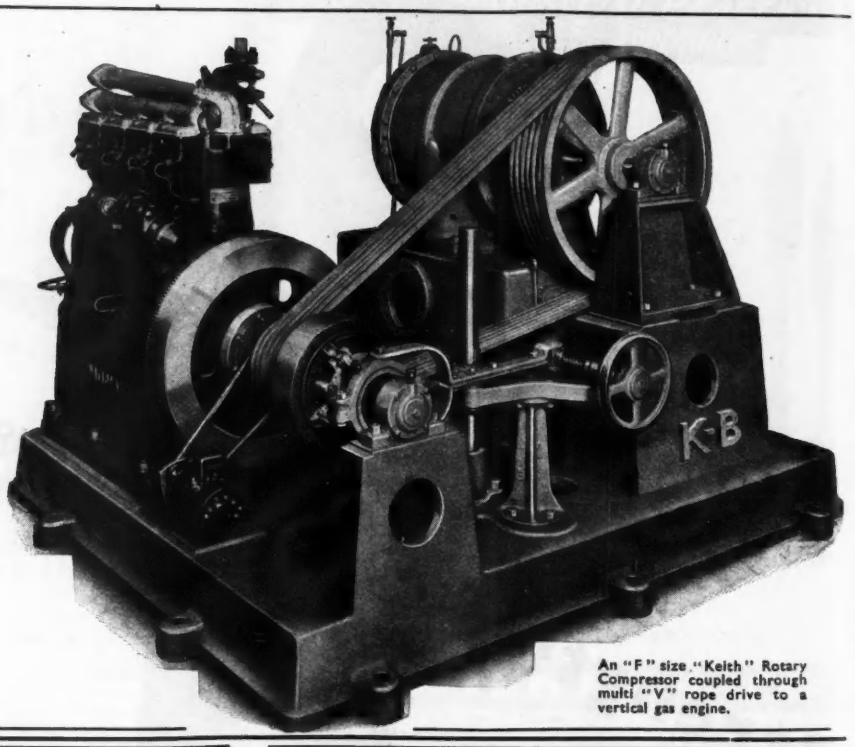

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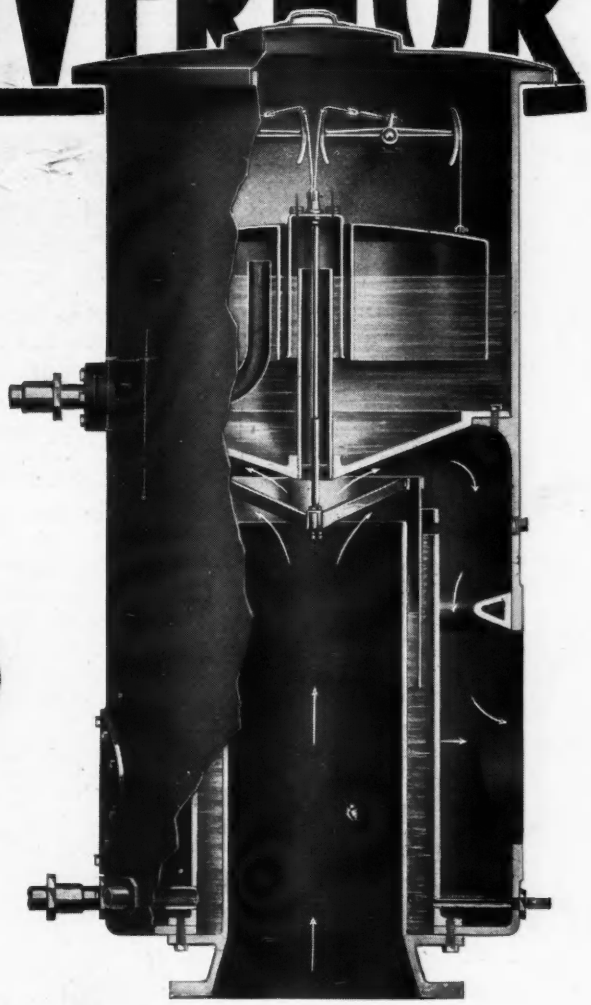

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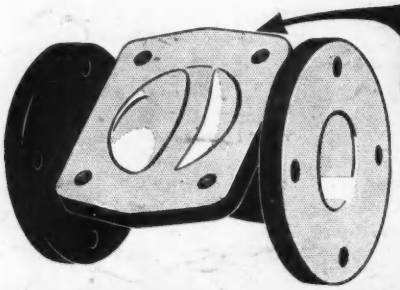

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